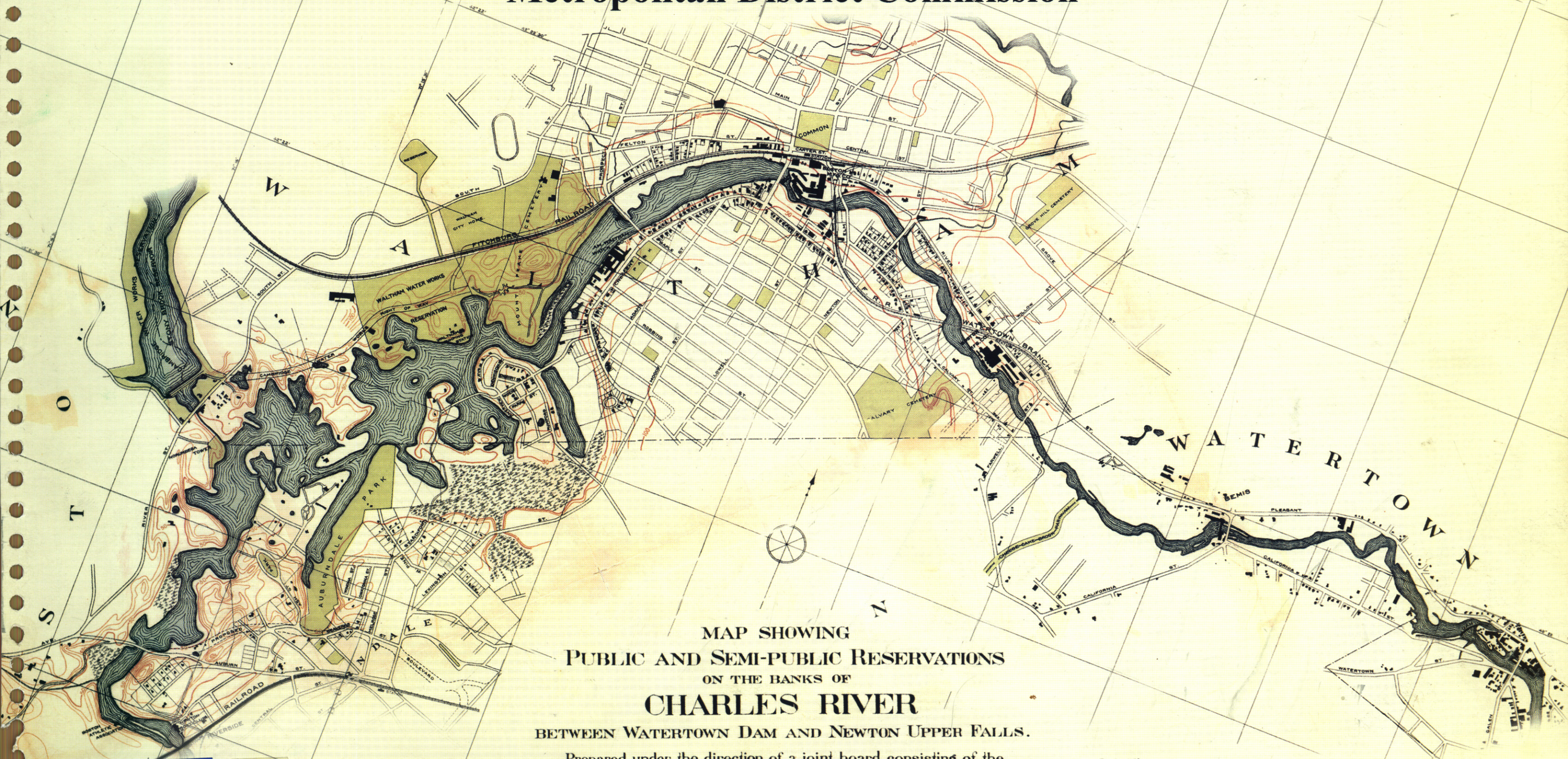


UPPER CHARLES RIVER RESERVATION MASTER PLAN

Metropolitan District Commission



MAP SHOWING
PUBLIC AND SEMI-PUBLIC RESERVATIONS
ON THE BANKS OF
CHARLES RIVER
BETWEEN WATERTOWN DAM AND NEWTON UPPER FALLS.




Prepared under the direction of a joint board consisting of the
METROPOLITAN PARK COMMISSION AND THE STATE BOARD OF HEALTH

Chapter 525, Acts of 1894

0 500 1000 1500 2000 2500 3000 FT.

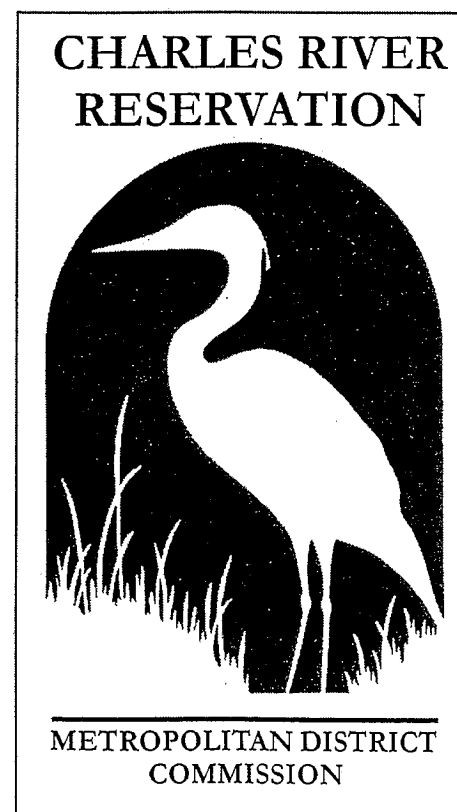
August, 1895.

Explanation.

Public or semi-public ownership, thus: 
Marsh land, thus: 
Contour intervals of 10 feet, thus: 
Figures on contours show elevations above Boston City base.

10.42

THE UPPER CHARLES RIVER RESERVATION MASTER PLAN



COMMONWEALTH OF MASSACHUSETTS

The Honorable A. Paul Cellucci, Governor

METROPOLITAN DISTRICT COMMISSION

David B. Balfour, Jr., Commissioner

Associate Commissioners

Robert H. Carr, Jr.

Avril T. Elkort

Darryl S. Settles

Charles F. Wu

Julia O'Brien, Director of Planning

Daniel Driscoll, Project Manager

OCTOBER 1998

MASTER PLAN CONSULTANTS

Carol R. Johnson Associates, Inc.

Landscape Architects and Environmental Planners

In Association with:

Lane Frenchman Associates, Inc.

Architects and Urban Planners

Bourne Consulting Engineering

Waterfront Engineers

Judith Nitsch Engineering, Inc.

Civil Engineers, Planners and Land Surveyors

Byrant Associates, Inc.

Consulting Engineers

CRJ Ecological Services

Wetland Scientists

The Upper Charles River Reservation Master Plan proposes that the new Reservation be thought of and reclaimed as a continuous Greenway. Although the word "greenway" defies specific definition, it is usually considered in the following terms:

greenway (gren' wa) n. 1. A linear open space established along either a natural corridor, such as a riverfront, stream valley, or ridgeline, or overland along a railroad right-of-way converted to recreational use, a canal, a scenic road, or other route. 2. Any natural or landscaped course for pedestrian or bicycle passage. 3. An open-space connector linking parks, nature reserves, cultural features, or historic sites with each other and with populated areas. 4. Locally, certain strip or linear parks designated as a parkway or greenbelt.

Greenways for America
Charles B. Little

All of these definitions seem appropriate for the Upper Charles.
The sum of which begins to describe the form and function of the new Reservation. . . .

TABLE OF CONTENTS

INTRODUCTION

The Upper Charles River
Reservation Project 1

Discovering the
Upper Charles Reservation.....1

New Expectations.....5

Master Plan Goals6

THE MASTER PLAN

The Setting of the Upper Charles 7

Summary of Recommendations 7

- Entries to the Reservation 7
- Pathways - Width and Materials 8
- Pathways - Location and Grading 9
- Open Space Linkages 9
- Bridges and Crossings10
- Separation from Private Property 11
- Property Acquisition & Easement Needs 11
- Habitat Reclamation and Enhancement12
- Safety and Security 13
- Encroachment on Public Land 14
- Interpretive Features and Signage..... 14
- Water Access and Use15

Segments of the New Reservation.17

- Watertown Square to Farwell Street
(North side in Watertown)18
- Watertown Square to Farwell Street
(South side in Newton)21
- Farwell Street to Moody Street Bridge
(Both sides in Waltham) 23
- Moody Street Bridge to Prospect Street Bridge
(Both sides in Waltham)..... 26
- Prospect Street Bridge to Commonwealth Avenue
(Northwest side in Waltham/Weston) 27
- Prospect Street Bridge to Commonwealth Avenue
(Southeast side in Waltham/Newton) 29

Walking Opportunities 31

IMPLEMENTATION

Phasing the Master Plan 32

Project Costs 33

Permitting Needs 35

Maintenance and Management
Guidelines35

APPENDICES

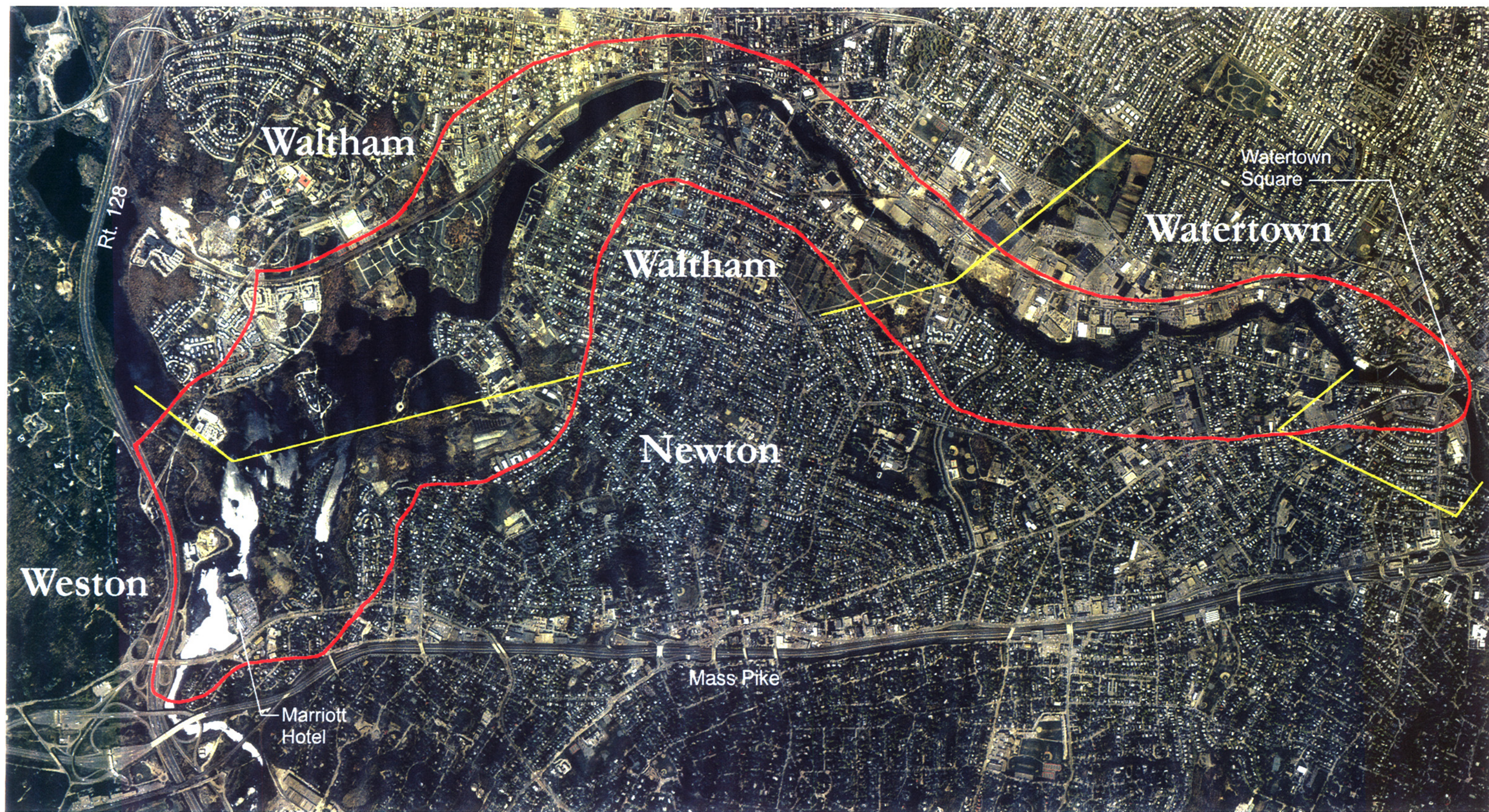
Historical Context37

Developing the Plan.....38

Encroachment Resolution 39

Citizens Advisory Committee40

The Master Plan (Fold-out Copy)



NORTH
SCALE: 1" = 1500'

— TOWN BOUNDARIES
— MASTER PLAN STUDY AREA

MASTER PLAN STUDY AREA



INTRODUCTION

INTRODUCTION

The Upper Charles River Reservation Project

The Upper Charles River Reservation has come full circle over the past hundred years. An initial period of land acquisition, park development, and heavy public use in the 1890s and through the early 1940s was followed by decades of neglect, abuse and lost public interest. Today, with ever cleaner



Viewing deck also used for fishing and sunning

river water, the public's historic love for the Upper Reservation has been re-awakened, stimulating renewed desires to protect and restore the River and its banks. The Upper Charles River Reservation Master Plan is an expression of this rekindled spirit. It also reflects the sincere commitment by the Metropolitan District Commission to recapture the River as an extraordinary community resource.

This Master Plan addresses a 5.75 mile section of the river, including 11 miles of protected river banks, from Watertown Square to Commonwealth Avenue in Newton and Weston. It is part of the MDC's larger goal to extend the Charles River greenway 14 miles to Brook Farm in West Roxbury. While this section of the river will be referred to throughout as the Upper Charles River Reservation, it is actually only a portion of the full Charles River Reservation

which extends further westward from Commonwealth Avenue to the South Natick dam. As this first section of the Reservation greenway is completed, it will provide a critical open-space link between the Lower Charles River Basin and the scenic "Lakes District", spreading over 190 acres through Newton, Weston, and Waltham.

The primary objective of this project is to reclaim and extend the public domain of the Charles River Reservation to the west from Watertown Square. This objective will be achieved by developing a public greenway that provides for the long-term ecological restoration of the river corridor as a self-sustaining natural environment. This will be the most substantial and dramatic improvement to this section of the Charles River in this century. Full implementation of this plan will be a major step in strengthening metropolitan Boston's claim of possessing one of the finest urban river greenways in America.

Discovering the Upper Charles Reservation

The Upper Charles River Reservation is currently one of the most hidden natural and cultural assets of the Boston metropolitan region. While the Charles River Basin in Cambridge and Boston is often considered the centerpiece of the MDC's park system, the Upper Charles beyond the Watertown dam is generally unknown to the public. The "Lakes District" of the Upper Charles is the best known part of the Upper Reservation and is again being appreciated for the boating, birdwatching, and fishing activities which it features so wonderfully. From a regional perspective, this area suffers from poor accessibility, and the inability of visitors to find their way around it easily on foot. The stretch of the Charles between the "Lakes District" and the Basin is virtually undiscovered as a public resource. Over

the years, many neighboring businesses and residences have turned their backs to this stretch of the river and closed it off from public use and enjoyment. Although contained in a narrow corridor, the natural beauty and recreational potential of this section of the river are vast and untapped.

What makes this undiscovered Reservation so special and alluring is the diversity of its natural environments, the variety of interesting built features, and the broad range of activities and experiences that it offers to the public. Unlike the Charles River Basin and the river farther west, each of which provides a somewhat consistent or homogeneous experience, every bend of the River here affords a different experience and a new delight. This diversity leads to a sense of surprise, mystery, and unfolding discovery. It is a place of unpredictability and evolving experiences that all ages can appreciate, learn from, and be challenged by during every visit.

Visitors to this portion of the Upper Charles River Reservation will quickly discover the striking contrast between its easterly and westerly stretches. This contrast starts with the river's visible "sheet" of water. The easterly stretch from Watertown Square to Prospect Street in Waltham is a narrow, winding body



Views across the scenic Lakes District

Upper Charles River Reservation Master Plan

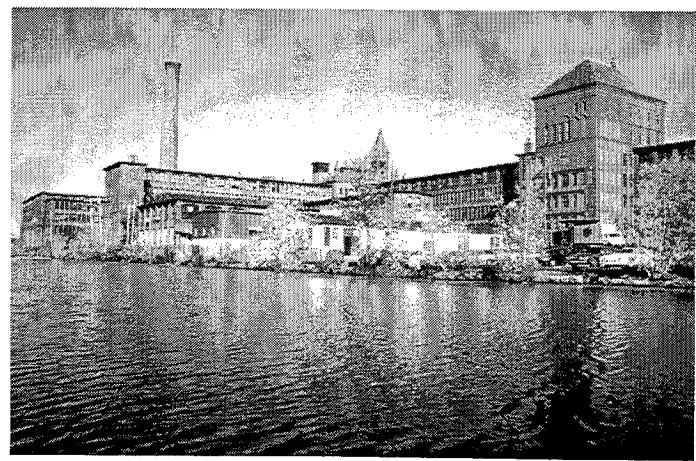


Bridges provide dramatic views of the river and its landscape

of water with a generally consistent width bordered by a ribbon of lush vegetation. Dams and arching bridges of various designs regularly punctuate this linear corridor. Views of the water are short and focused, extending only to the next bend or meander.

The westerly Lakes District, however, is characterized by its broad and placid water sheet, its undulating forested shorelines, small islands, and its series of intimate coves made possible by the damming of the river at Moody Street in Waltham. The water body is too wide to be bridged, and vistas over the calm water are usually long and panoramic.

Visitors will also discover the rich cultural history of the Reservation from an array of artifacts, buildings, and other clues still remaining in the landscape. The industrial heritage of the river corridor is prominently displayed by the four dams on the River and the



The historic (1850's) Waltham watch factory complex

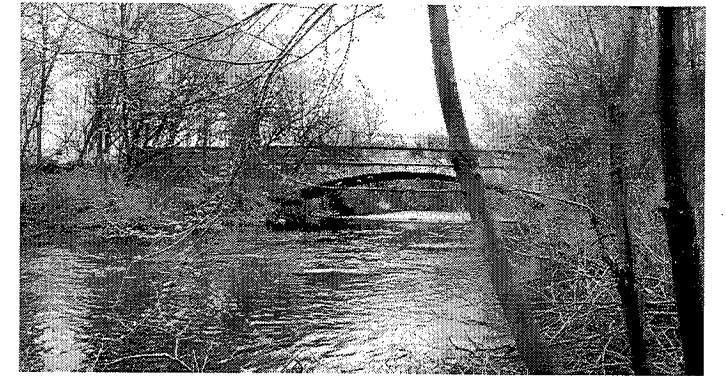
original brick mill buildings which border the River's edge. Located in the historic Waltham Company Mill, the Charles River Museum of Industry recounts the amazing technological feats performed along the river banks starting in the 1800s. In times past, this was a working river with many industrial "firsts," such as the first textile mill and the first bleachery in the United States. Other features such as the pile foundations for the once famous "Nuttings on the Charles" dance hall, the mysterious Norumbega Tower, and the stone bridge in the middle of Auburndale Park provide us subtle clues about the



Norumbega Tower (1889)

cultural evolution of the area.

Walking the River's edge, the visitor discovers the beauty and uniqueness of the bridges which span the river and connect communities. Constructed of concrete, timber, steel, and cut stone, the arched bridges and railroad trestles lend a sense of cadence and orientation. Between the scenic bridges, the river's four dams, built at varying heights, create a soothing sound of rushing water and the feeling of energy being released as the river works its way tirelessly towards the harbor. Each dam is different and reveals its own interesting story. The dam at Bemis Mill was the only "rolling stone" dam in North America, operated by a rolling cylinder across the river which made the dam easily adjustable



Farwell Street Bridge

to any height. Scenic and functional fish ladders are incorporated in the Moody Street and Watertown dams to encourage the alewife and shad fish migration upstream each spring.

The many parks and recreation facilities along the River also contribute to the rich diversity of the Upper Charles Reservation. These facilities will be destinations within the greenway system. Facilities bordering or within the Reservation include two public swimming pools, tennis courts, playgrounds, an ice skating rink, a street-hockey rink, canoe and kayak rentals, and several baseball fields within neighborhood parks. Numerous community parks also abut, or are part of the Reservation. These include Allison Park and Auburndale Park in Newton, Norumbega Park in Newton/Weston; Forest Grove, Landry and Riverwalk Parks in Waltham; and Cannalonga Park in Watertown. Although technically



MDC's Cannalonga Park in Watertown

not a public park, the gracious hills and mature trees of Mt. Feake Cemetery add considerable breadth to the landscaped open space along the River. All of these open spaces will become more accessible to the public as the new Reservation greenway is completed.

Part of discovering the magic of the Upper Charles Reservation lies in participating in the wealth of activities which take place in all seasons of the year, both on water and along the River's shores. Canoeing, kayaking, rowing, power boating, fishing, ice fishing and ice skating are the most popular water-based uses. Many of these occur in the spacious Lakes region. Special events include the annual "Run of the Charles" canoe race sponsored by the Charles River Watershed Association. This race attracts all



Canoeing the Lakes District

ages and skill levels in trying their hand at mastering the river.

Along the river's wooded edges, visitors jog, picnic, hike, mountain bike, walk and amble. In the wilder sections of the river corridor, nature observation and bird watching are excellent. The solitude of some parts of the Reservation encourages quiet observation of the water, birds and gently moving foliage. In snowy winters, cross-country skiers are seen winding their way quietly

through the woods. Thus, this is truly the "Peoples' River"—with something for everyone to discover throughout the year. The daily "undocumented" use of the River by many people adds immeasurably to the quality of life in this region.

For most visitors to the Upper Charles Reservation, the most startling discovery is that this stretch of river, while hidden in such a densely populated urban region, can be so wild and natural. Even the narrowest section of the Reservation evokes a wonderful wilderness-like feeling, making the tensions of surrounding city life fade from consciousness. Although degraded in many places from various human activities, the landscape of the Upper Charles exhibits remarkable diversity and an array of very healthy wildlife habitats. These environments offer food, water, cover, and space: the four essential needs for wildlife survival.

Walking the 5.75 mile length of this Reservation, visitors can discover seven noticeable "cover types" or habitats.

Open Water

First, Open Water habitat is provided by the River itself and includes the large bays and coves found within the Lakes District located in Newton,



In places, the open water habitat is being eliminated by invasive aquatics

Waltham, and Weston. The large areas of open water checkered with aquatic vegetation provide

excellent habitat for various species of reptiles, waterfowl, and mammals (muskrats in particular). These species forage on the vegetation and/or insects supported by the dense aquatic plant life. Other species, including wading birds, such as great blue herons, are attracted by the small fish and larger insects in the shallower waters. It is not uncommon, while canoeing or walking along the shore, to see the graceful silhouette of a great blue heron flying across this expanse of open water or to see a pair of mallards dabbling in the calm waters of a cove. Common fish include pickerel and large-mouth bass, along with northern pike (stocked to compete with less desirable, over-abundant species, such as carp). Fish-eaters such as belted kingfisher and several species of mergansers, can be seen foraging within the open-water areas of the Charles River.

A few species of anadromous fish, salt water fish that spawn in fresh water, inhabit this section of the Charles every spring. River herring or alewives, rainbow smelt and American shad travel upstream by the millions, aided by a series of fish ladders, similar to the one at the Watertown Dam. The shad stopped entering the Charles to spawn early in the century, probably due to pollution and construction of the Charles River Dam in 1908. Restoration efforts occurred in the 1970s when the Charles was stocked with pre-spawning shad from the Connecticut River. By the early 1980s, with the addition of fish ladders at some of the lower dams, populations began to increase.

Aquatic vegetation is concentrated in the open-water areas of the Lakes District. However, several of the more abundant plant species found in this area such as Eurasian milfoil, water chestnut and water lilies, are not eaten by most wildlife. These non-native species choke the river and prevent the growth of more desirable native aquatic vegetation which provides food and cover for fish and wildlife.



Shallow Marshes provide camouflage for predators and prey.

Shallow Marsh

Shallow Marsh habitat is found along portions of the Charles River banks and small islands within the river, particularly in Robert's Bay of the Lakes District. Large areas of this habitat extend through the Flowed Meadows Conservation Area in Newton. Amphibians inhabit this cover type during both the breeding and non-breeding season. Herons, camouflaged by rushes and sedges, use shallow marshes to forage on frogs and other prey. Other ground-gleaning birds, such as sparrows and grackles, also forage and nest in this habitat, while avian gleaners, such as swallows, forage on insects above the marshes.



Shrub swamp/ Wetland meadows give important cover for wildlife

Shrub Swamp / Wetland Meadow

Shrub Swamp/Wet Meadow occurs within small islands in the River and also borders much of the Upper Charles, particularly within its lower reaches. Areas of shrub swamp and wet meadow are also evident within portions of Kingsbury Cove, near the terminus of Edgewater Drive, and within the Flowed Meadows Conservation Area. Consisting primarily of water willow and cat-tail, this habitat provides important cover for wildlife that forage along and within the River. Wildlife may be less likely to use portions of the River lacking a dense shrub understory since it provides a solid screen against human activities.

Several species of frogs and snakes inhabit this cover type, as do waterfowl such as black ducks, wood ducks and herons. Other bird species, such as ground gleaners and lower canopy gleaners, also forage and nest within this cover type. Mammals such as the white-footed mouse, eastern cottontail, opossum, and shrews also flourish in this habitat.



Floodplain forests give the Reservation its wild and natural look

Forested Floodplain Wetland

Forested Floodplain Wetland may be the most important cover type for supporting wildlife diversity along the Charles River. This is attributed primarily to the presence of multiple layers of vegetation within

the riparian zone which provide a wide variety of nesting and feeding places.

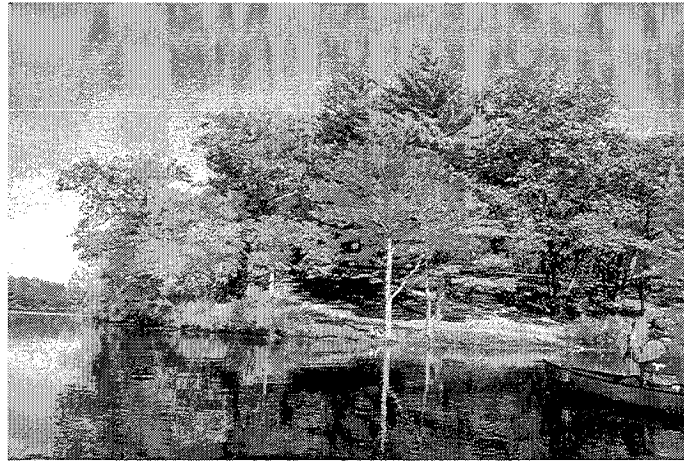
The larger areas of forested wetlands occur near Kingsbury Cove and the terminus of Edgewater Drive in Waltham, within the Flowed Meadows Conservation Area in Newton, and along the southern shore in the lower reaches of the River. Particularly valuable forested floodplain wetlands noted along the southern bank include a large expanse located west of the Farwell Street bridge in Waltham, and an extensive area located east of Cheesecake Brook and west of the Bridge Street crossing in Newton. The two areas are extremely valuable wildlife refuges within a heavily



The forest canopy offers important nesting sites

urbanized area.

These rich forests are characterized by an expansive tree canopy. Species noted within the overstory include red maple, silver maple, and river birch. The seeds are consumed by a variety of wildlife including songbirds and mammals. These trees also provide nesting habitat for many birds, including colonies of black-crowned night herons and, if large enough, provide suitable cavities for medium-sized mammals such as raccoons and opossums. The trees also provide perch sites for birds, such as flycatchers, kingfishers, and raptors which hunt along the River.



Forest Grove Park in Waltham

Oak / Pine Forested Uplands

Oak / Pine Forested Uplands are primarily present within the Lakes District of the Upper Charles where they provide such a scenic shoreline. Smaller areas are located along the north bank of the River, east of the Newton Street bridge in Waltham and east of the Farwell Street bridge in Watertown. Red oak and white pine are the most prevalent species in this habitat within the upper reaches of the River, while various hardwoods including red oak, black cherry, red maple, and ash predominate in the lower reaches. A variety of wildlife inhabit these oak / pine forests, including songbirds such as wood warblers, whose bright colors are a favorite of birdwatchers.

Clusters of white pine and some eastern hemlock are unique to the Lakes District. Stands of evergreens are important as nesting or roosting for some species of birds, such as the great horned owl. These stands contribute to the diversity of wildlife within the Charles River corridor. The lack of substantial evergreen stands is a notable deficiency of the Upper Charles landscape.

Developed and Non-Forested Upland Areas

Developed and Non-Forested Upland Areas include parkland and other developed areas of open space such as Mt. Feake Cemetery. These areas are typically savannah-like in appearance, with a tree



Entrance to Mt. Feake Cemetery

overstory and grass understory, or they are characterized by well-maintained lawns. Although not providing diverse wildlife habitat, these areas can provide important travel corridors for wildlife if they are located between more vital habitats.

Non-Native and Invasive Plant Species

Non-native and Invasive Plant Species are primarily located within the lower reaches of the Upper Charles. These areas are characterized by the presence of non-indigenous species such as tree-of-heaven, Norway maple, Japanese knotweed, and multiflora rose, along with invasive species such as false indigo. Although multiflora rose provides berries that are used by many species, most non-native species provide little food benefit for most wildlife. These plants still have some value in



Thickets of invasive species also block views of the river

providing nesting habitat or cover for small mammals and various songbirds.

New Expectations

It is significant that over 100,000 people live and work within walking distance of this fascinating landscape and its rich habitats. However, much of the Reservation goes unnoticed and may be hard to find if one is not a nearby resident or a very curious explorer. Presently, there are few clues that the public is invited into this natural preserve. Once the Reservation is found, passage is difficult or impossible due to a variety of obstacles, including steep slopes, fences, thickets, discontinuous trails, and dumped or discarded materials.

The Master Plan for the Upper Charles recommends improvements to the Reservation that focus upon restoring, enhancing, and expanding its ecological assets. This will be coupled with improved accessibility along the river corridor, thereby making its riches and excitement more easily available to all people of the region. For years to come, people will be able to enjoy the river as a unique natural and recreational resource, while learning about the river's ecosystem and the importance of our enduring relationship with it.

Master Plan Goals

During the initial planning phases of the project, a set of working goals was established with the Citizens Advisory Committee to guide the greenway master planning. These goals and related objectives present the purpose of the project and suggest its potential recreational and environmental benefits.

1. Improve access to the river and/or greenway for walkers, hikers, boats, canoes, bicycles, anglers, and the physically challenged.

- Create multiple access points or gateways to the Reservation, and make entries more formal and visible where appropriate.
- Improve pedestrian access from neighborhood streets and open space.
- Improve, expand and create parking areas where possible.
- Create or improve informational/directional signage to make the Reservation and its entries more widely known.

2. Improve circulation and open-space connections along the river corridor.

- Provide a continuous public pathway on one or, where feasible, both sides of the river corridor.
- Use low-impact boardwalks and bridges in steep and wet areas in order to achieve continuous pathways.
- Remove physical barriers blocking passage along the River's edge.
- Create safe pedestrian crosswalks and add traffic lights where necessary at bridge crossings.

3. Eliminate gaps in public ownership

- Acquire private property and/or develop public access easements.
- Work with semi-public property owners to encourage public access.

4. Reclaim all MDC property on which abutters have encroached.

- Clearly demarcate the MDC property line with fencing, guardrail, planting or boundary markers.

- In conjunction with the MDC and property owners, implement a means of removing stored and dumped materials from MDC property.

5. Protect and enhance the character of open space and the shoreline along the River.

- Enhance/upgrade areas where there are notable views, topography, scenic structures, etc.
- Enhance/upgrade current park land which abuts the Reservation.
- Remove trash and clean up abandoned dumping areas.
- Revegetate encroachment areas using indigenous plantings.
- Preserve as much existing riparian vegetation as possible.

6. Protect and improve visual/ scenic quality.

- Improve access to prime viewing spots, and create new viewing areas where appropriate.
- Selectively prune vegetation to open new views to the river.
- Promote bridges/ dams as major viewing points.
- Screen poor views with new vegetation.
- Cover obtrusive structures with plant materials.
- Clean up areas along the river edge and within the corridor that impair visual quality.
- Enforce scenic easements and propose others where appropriate.

7. Promote sustainable environmental quality.

- Protect sensitive ecology, such as wildlife habitat and wetland resources.
- Limit interaction between wildlife species and Reservation users.
- Improve water quality and wildlife habitat.
- Improve potential for anadromous fish migration.
- Promote species diversity, eliminate exotic and invasive plant species and revegetate with native plant materials.
- Restore and revegetate eroded slopes and damaged or reconfigured river banks.
- Promote low maintenance by avoiding large areas of mown grass and other planting requiring extensive care.
- Use native/ natural recycled materials for site elements whenever possible.

8. Maximize educational/ interpretive opportunities.

- Explore the interpretive potential of historic buildings and sites, cultural evolution, unique natural areas, and wildlife habitat.
- Explore educational potential of natural resources, and cultural evolution of the river corridor.
- Explore partnerships for educational and interactive activities with institutional abutters.

9. Limit potential conflicts between Reservation activities.

- Where possible, separate path uses (e.g. walking versus cycling versus birdwatching) through design, location, materials and signage.

10. Maximize safety of Reservation users and privacy of abutters.

- Use planting and fencing to separate public and private property.
- Emphasize good visibility from adjacent properties.
- Post safety and use regulations.
- Employ park rangers to patrol the path system on bike.
- Encourage arrangements with local police for surveillance.

While achieving the above goals will clearly facilitate improvement of water quality, the ecological health of the River depends heavily upon an adequate amount of water flowing within its banks. Although not within the purview of the Master Plan, resolving the problem of water removal from the watershed and consequent flow reductions is critical in the continuing rebound of the Charles River. Improvements to the river corridor, such as those proposed in this Master Plan, combined with efforts by groups such as the Charles River Watershed Association to normalize flow will help this successful rebound.

The Upper Charles River Greenway will also serve a larger purpose than the above goals. The new Reservation will link several communities and bring people together to share in a common natural resource. Thus, at the heart of this landscape reclamation effort lies the joining of neighborhoods and the enduring social good which will develop in the process.



THE MASTER PLAN

MASTER PLAN

For best understanding of the following text, please refer to the fold-out Master Plan located at the back of this report.

The Setting of the Upper Charles: Transition from Woodland to Basin

This stretch of the Charles River, between Watertown Square and Route 128, can be thought of as a transition between the Charles River Basin and the westerly reaches of the River beyond Newton Lower Falls. The Charles River Basin has the breadth and stillness of a lake. Its water sheet is generally broad and is bounded by busy roadways, traditional parkland and open banks. This "River Park" is characterized by unobstructed vistas and heavily used, wide paved paths often passing through expansive lawns. This area is refined, controlled and fairly urbane. Movement along the edges of the basin is often at the rapid pace of bicyclists, passing roller bladers, and runners.

In contrast, the westerly reaches of the Charles River, beyond the Lower Falls, are more narrow and winding. Here, there are extensive wetlands, forested



Vegetated edges of the westerly reaches of the Charles River

areas, and thickly vegetated edges. Wildlife is abundant. Expansive vistas are replaced by shorter, more intimate views within each turn of the river. There is a more solitary, quiet "wilderness" feeling here. Trails and paths in these upper portions of

the Charles River are narrow and winding. Movement along them by foot or mountain bike is slower-paced, more exploratory and introspective.

As a transition landscape, the Upper Charles River Reservation combines attributes of both the Charles River Basin and the western reaches of the Charles, and thereby affording very diverse and contrasting environments. Along this stretch of the River, the water sheet varies from "lake" to stream quality, interrupted by frequent dams. The edges of the river in this stretch change from wild and natural to hard and urban. Riverside parks in this area include heavily forested preserves, along with "River Parks" with expanses of lawn and scattered shade trees.

The new Reservation is not a place of wide urban paths set in cut-grass plains. Rather, it is a place of 6 foot to 8 foot wide paths, trails and boardwalks through woodlands. This more narrow path width will encourage visitors to slow down and experience some of the intimacy that this stretch of the Reservation greenway affords. Existing trails are improved only where appropriate. Also, unlike "The Basin", this is not a place of uninterrupted bike traffic on both sides of the River. Bicycles are allowed; however, foot travel is encouraged throughout as the best way to discover and appreciate the diverse features of both natural and man-made origin.

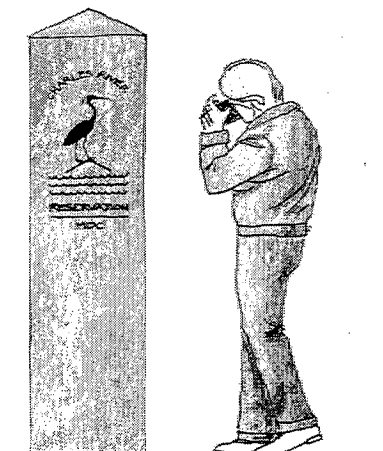
Summary of Recommendations

Entries to the Reservation

Three primary visitor centers are proposed to improve visible access to the Reservation. These are located at either end, and in the middle of the Reservation. They include the MDC's Dealtry Pool in Watertown, the Charles River Museum of Industry in Waltham, and the Charles River Canoe and Kayak Service in Newton. These existing facilities are evenly spaced to serve the Reservation efficiently, and all

have easy access to nearby public transportation. They include existing visitor services, such as public parking, restrooms, drinking water, indoor shelter, information display, telephones and full or part-time staff for at least the summer months of the year. At the outset, each of these points will be identified by the familiar 4 foot x 6 foot MDC sign announcing the Charles River Reservation. Free brochures, doubling as "trail guides," and other critical information, such as "Rules of the Reservation" will be available here. Each facility has a place where school children and teachers can gather at the start of Charles River field trips. As the new Reservation becomes better known and more frequently used, the three gateway locations can easily expand their services becoming more formal visitor centers. Large scale map models of the entire upper Charles region will be displayed, along with more extensive educational information describing historical, natural, and recreational features. MDC park rangers will lead interpretive "river walks" from these locations which will eventually become discovery centers with the goal of promoting environmental awareness.

Primary entries to the Reservation will be less prominent than the visitor centers, but appropriately mark pedestrian access ways from bridge crossings and neighboring streets and open spaces. These entries will be accentuated by special circular paving and six foot high granite pillars etched with the familiar Upper Charles Reservation logo, a silhouette of the Great Blue Heron. When needed, side faces of the granite pillars can be used to carve directions, mileage to destinations, or pictorial illustration of features that may be seen in the Reservation.



The Reservation entry from Galen Street to Riverbend Park in Watertown Square should receive special treatment. Currently this entrance is suggested only by a widening of the sidewalk paving. The elegant balustrade of the Galen Street bridge could be extended northerly in a semi-circular configuration to give prominence to this important gateway. Historic lights similar to those on the bridge could flank the opening in the balustrade and further mark this easternmost entry to the Upper Charles River. Pavement design might include interpretive graphics or an abstracted map of key features of the upper Charles.

Pathways - Width and Materials

Four pathway types are recommended for the new Reservation. Path treatments were selected based upon the transitional setting of the Upper Charles River Reservation, the sensitive ecology encountered in this floodplain, the shape and width of the corridor, and also expected trail user volume and types of use. The path's location in such a fragile environment suggests less than the minimum 8 foot paved width that is generally acceptable for a formally designated and signed bike path. While bicyclists are expected to use this path, slow speeds will be strongly encouraged to insure the safety of all users.

1. The primary path is 7 foot wide bituminous concrete with a 12 inch wide shoulder of cement-modified soil on either side. This configuration allows enough hard surface to accommodate emergency and maintenance vehicles, bicycles, rollerblades and wheelchairs, yet is not excessively wide for such a narrow corridor. The path shoulder gives extra breadth, but the ground surface remains permeable. Cement-modified soil is somewhat permeable and is mixed in place with native subsoil.

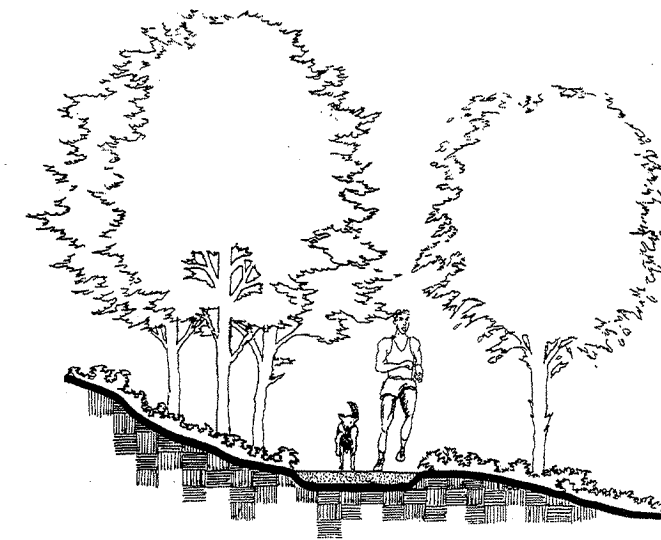
2. Along particularly narrow sections of the Reservation, heavily wooded stretches such as forested floodplains, or on loop trails where there is



A good pathway example found East of the Upper Charles

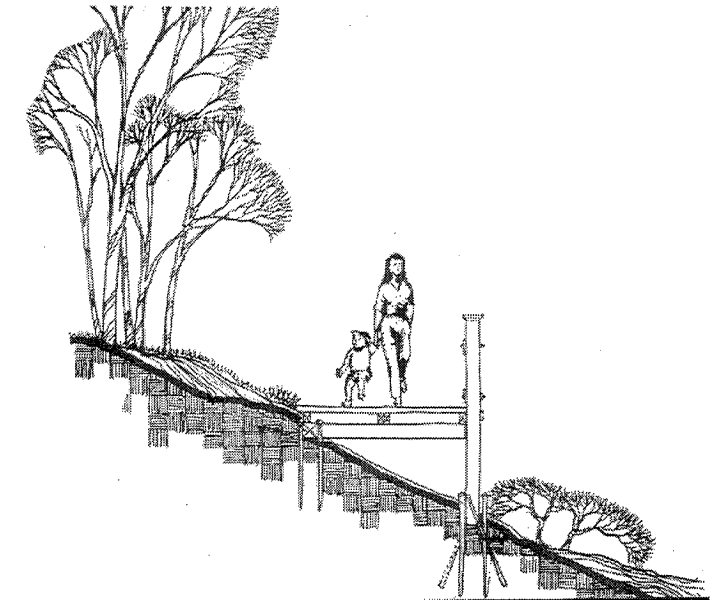
minimal traffic, a 4 foot wide cement-modified soil path is recommended. This more narrow and permeable path treatment improves access with minimal impact.

3. Where the path traverses sensitive resource areas, such as wetlands and particularly steep or eroded



A 4' wide soil path in a wooded area

slopes, or where meeting grades would result in excessive earthwork or vegetation removal, the use of elevated boardwalks is advised. Overlooks and viewing platforms will be built into the boardwalks to give visitors full advantage of these scenic locations.



An elevated boardwalk may be used to avoid excessive earthwork on a steep slope.

4. Lastly, in areas where there are already narrow-trodden trails and the vegetation is particularly



Existing path in the Lakes District

sensitive, and where only occasional foot traffic is anticipated, existing paths will be left and improved. The paths will be made more visible by trimming and pruning existing vegetation. In some cases, the existing trail will be better defined with the addition of a low (12 inch high) wooden railing. As a simple

marker, this rail will serve to encourage walkers and mountain bikers to stay on the pathway and not wander off into sensitive vegetation and wildlife habitat.

Pathways - Location and Grading

The Master Plan recommends a continuous and safe public pathway along the river corridor, on both banks where possible, from Watertown Square to Commonwealth Avenue in Newton. To accomplish this objective in such a constricted environment with such fragile ecological zones, it is as important to consider where the pathway should not be located as it is to consider where it should be located. Thus, the following locational criteria were developed as "avoidance" factors to guide pathway alignment toward sustainable solutions.

1. Avoid locating long stretches of the pathway immediately adjacent to the River. Many of the wildlife species that inhabit the corridor forage within the Charles River or along its banks. The frequent presence of people along the walkway can disturb these species.
2. Avoid siting the pathway in wetlands, and other more uncommon habitats such as scrub-shrub areas. These limited areas can provide habitat for certain species which may not be plentiful elsewhere along the corridor. Bisecting these habitats may adversely affect these species by increasing disturbance associated with people and pets.
3. Avoid locating the pathway along steep slopes adjacent to the river. These areas often provide den sites for several mammalian species, and locating a pathway in these areas would likely preclude this use, in addition to creating erosion problems and loss of vegetation due to excessive grading.

4. Avoid locating the pathway through large depressions located near the River, primarily within areas of forested floodplain, as these sites can contain shallow pools of standing water during spring which can function as critical amphibian breeding areas. The small ponds on Sandy Hook also may support dense aggregates of breeding amphibians in the spring. The walkway should avoid these areas to the greatest extent possible.
5. Divert paths well away from known, extremely sensitive areas such as the Black-Crowned Night Heron roost present within the lower reaches of the Reservation.

Ideally, pathways should be located on high ground and pass through areas having the least ecological value. Examples of these are areas dominated by exotic or invasive plant species and other disturbed areas such as existing roads or trails where they do not intersect critical wildlife habitats. Existing areas of fill or other degradations caused by abutters over the years are advantageous locations due to the negligible impact path construction would cause.

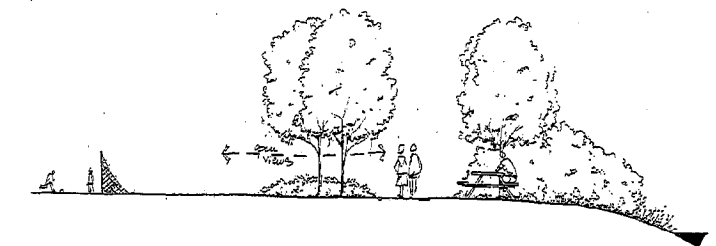
Where the pathway is interrupted, such as at bridge crossings and also where there are gaps in MDC ownership, path users will be brought out to existing sidewalks and directed toward the next entrance to the Reservation. Cross-walks and heron foot prints stenciled on the pavement should connect the pathways in these instances.

Pathways should be graded to closely follow existing grades and have smooth vertical transitions. They should be graded smoothly between control spots and be free from abrupt dips and humps. To be universally accessible, pathways should have a maximum longitudinal slope of 5%, a maximum cross-slope of 2%, and a minimum cross-slope of 1%. Side slopes of pathways should transition back to existing grades at a 4:1 pitch where possible.

Concentration of storm water behind the path without proper outlet should be avoided.

Open Space Linkages

One of the greatest single public benefits of creating this greenway along the Upper Charles Reservation is the linking together of existing open spaces, playgrounds, and parks. The new pathway will connect and thereby expand the value of these existing recreational facilities. Conversely, the existing public parks will provide access ways into the new Reservation. Thus, the true value of the whole system will clearly exceed the sum of its disparate parts.



Planting low shrubs and shade trees between the pathway and abutting recreational fields will provide some physical separation between uses, but still allow a visual connection

The path system should help link existing parks and open spaces to the Reservation. Where existing parks are across roadways from the Reservation, crosswalks and visible entries to the Reservation are recommended to facilitate access. Where existing parks abut the Reservation, the path and planting should encourage interaction between park and Reservation users. At Forte Memorial Park, for example, low planting is proposed between the Reservation path and the park's playing fields to provide visual connection between the public spaces. An open lawn-area is also suggested with picnic tables for joint use. The exercise trail in Forte Memorial Park will connect directly to the Reservation path system, further facilitating linkages and shared benefits.

Two properties offering critical open-space linkages in the Upper Charles Reservation are Mt. Feake Cemetery and the forested parcel on Sandy Hook Cove owned by Brandeis University. At present, public access to both parcels is technically prohibited; and together they control almost 12 miles of riverfront at the beginning of the Lakes District.

Public use of these scenic properties is certainly in the best interest of this region, and appropriate regulations for usage were cooperatively developed by the MDC, the Cemetery and the University. Rules of usage would be posted frequently and enforced by both owners as well as MDC officials. Formal access easements, or other forms of legal agreement among parties, will be required to enable public use and to ensure protection of these valuable resources.

The Reservation pathway should link the abutting communities by promoting access at all adjacent open spaces and across bridges. It should serve as a common thread weaving together all communities adjacent to the River and fostering a regional identity.



Newton Street Bridge

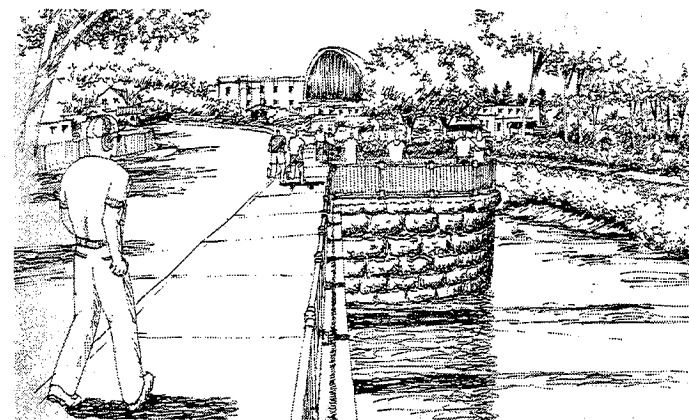
Bridges and Crossings

There are seven vehicular bridges that span the river in this stretch of the Upper Charles River. Since the sidewalks coming off the bridges make contact

with the Reservation at the foot of each bridge, these crossing points have tremendous potential for bringing visitors into the Reservation. The elevation of these crossing points is often well above the elevation of the pathway along the banks of the river. Thus, some amount of filling will generally be required to construct the path connection leading from the bridge sidewalk to the parkland. Despite this difficulty, these connections can usually be made and are essential if the Reservation greenway is to be at all continuous and useful for traveling any distance.

In addition to their role as major access locations, the bridges, both vehicular and pedestrian, serve as prime viewing points, providing pedestrians with some of the most beautiful views along the river corridor in all seasons. Views from the bridges are only rivaled by the wonderful vistas from the peninsulas and high promontories of the Lakes District.

Since much of the river and its varied landscapes can only be seen from the bridges, they are ideal locations for interpretive and educational materials explaining the cultural evolution of the river, its natural assets, and the wildlife inhabiting its shoreline. The bridge railings could be cut and altered to provide semicircular or rectangular "niches" cantilevered outward from the edge of the current bridge. These intimate overlooks on the bridges could be fitted

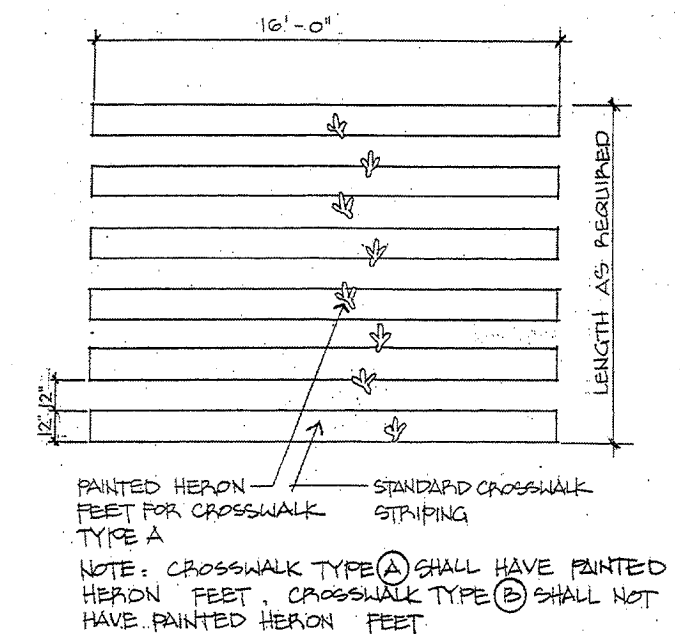


Example of using an existing bridge abutment as an overlook

with seating surfaces, plaques and other graphic panels. Passersby might rest comfortably for a moment, learn something about the River, appreciate and learn about the view, and then continue their travels.

This casual introduction to the River would encourage people to enter the Reservation at the foot of the bridge and experience the river more closely. Since the bridges are not owned by the MDC, bridge modifications as described above would have to be undertaken by the cities and towns as a long-term endeavor.

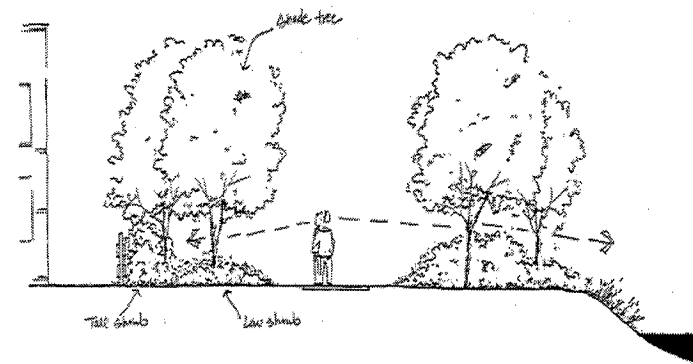
Access points at bridge crossings would be marked clearly with granite posts as primary entrances to the Reservation. Visitors could be directed from one entry to another by "heron's feet"



tracks painted on the sidewalk leading over the bridge. Safe travel across roadways between access points should be ensured by installing clearly marked crosswalks and pedestrian-activated signals where feasible. Where signals are not possible, "yield to pedestrians" signs should be prominently displayed in both directions. As with bridge rail alterations, crosswalks and signals would be constructed under the jurisdiction of the city or town involved.

Footbridges are particularly special in the Upper Charles Reservation since they bring the pedestrian closer to the water itself and the experience of the River is more intimate without the congestion and noise of passing cars. The Master Plan proposes two new footbridges to complement the three existing ones at Dealtry Pool, Landry Park, and the Bleachery Dam. The first would be located in the vicinity of Cheesecake Brook in Newton, where immediately west of the Brook's entry into the Charles, a gap occurs in MDC ownership of the river bank. Spanning approximately 125 feet, the new footbridge will allow visitors coming west from Bridge Street to cross the River and continue their travel on the north bank in Watertown, adjacent to Super Stop & Shop.

The second footbridge is proposed to span the Stoney Brook inlet and adjacent wet area just west of the WCRB (radio station) property on Roberts Bay in Waltham. This small bridge will allow pedestrians to continue passage along the shore without detouring inland to South Street and back to avoid the stream.



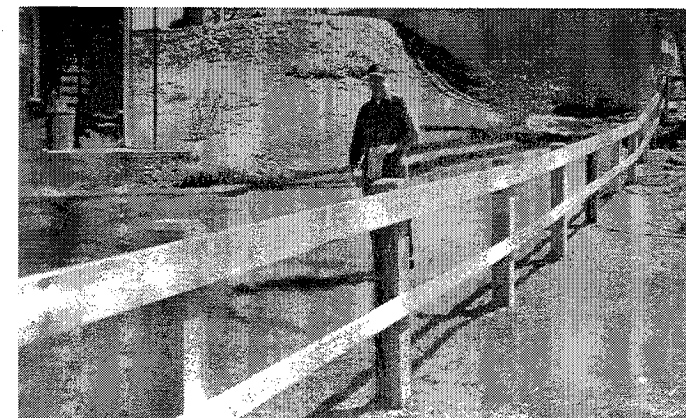
Where the pathway abuts industrial properties, low shrubs near the path backed by tall shrubs at the property line are appropriate. Shade trees, or evergreen trees where space avails, should be interplanted to complete the screen.

Separation from Private Property

Densely planted buffer zones should be used throughout the Reservation to visually screen adjacent industrial facilities and parking areas from path

users and to provide a sense of privacy and separation for homeowners. Buffer planting at residential properties should be of low to medium height, and broad in lateral extent to provide a feeling of physical separation, but, at the same time, to keep open views from residences to the River. For maximum effect, buffer planting at industrial properties can utilize a mix of evergreen trees, thus satisfying screening needs while providing the much needed evergreen nesting and cover sites. Road planting zones in each case will focus travel through MDC lands along the pathways and discourage wandering from the path onto private properties.

The edges of the Reservation will be visibly marked in three ways. At industrial or commercial properties, a continuous **wood timber guardrail** is proposed along the property line. Openings in the guard railing could be made where employee access to the greenway is denied. At residential properties, a **low wooden fence**, 3 feet 4 inches in height, consisting of 6 inch square posts and two 2 inch by 4 inch rails, is proposed to bound the Reservation in a very nonintrusive but still deliberate way. Again,



Low wooden fence used to delineate property line at residential property.

openings in the fence could be made to allow abutters access to the Reservation. Finally, along open spaces, parks, or lengthy vacant lands, **single, wood posts** 3 feet in height spaced at a distance of 50 to 100 feet should be used to discreetly establish the

limits of the public land. All three methods of marking the property line are intended to let visitors know the extent of the Reservation, and to avoid future disputes over the use of public lands. Although not as durable as stone "bounds," the wood materials are appropriate for the natural greenway setting.

Property Acquisition and Easement Needs

MDC ownership of the River's edge is nearly continuous through the Upper Charles Reservation. The combination of MDC lands, local parkland, and other community properties having some public use (e.g. Mt. Feake Cemetery, etc.) will account for approximately 85 percent of the Upper Charles River shoreline. Shoreline parcels that do not allow public access along the river due to lack of ownership and/or physical obstructions include:

Group 1 Parcels:

Acquisition or Easement Recommended

For the Master Plan to be implemented successfully, it is imperative that public access be permitted through these high priority parcels:

- A. North bank, behind Watertown ice skating rink and Stop & Shop property - private property.
- B. South bank, behind Longview Fibre - between Elm St. and Embassy Parking lot.
- C. North bank, west of Prospect Street Crossing Mt. Feake Cemetery limited access property.
- D. North bank, west of Mt. Feake Cemetery - private property of Brandeis University - (currently have conservation easement).

Group 2 Parcels:

Public Easement Desirable

Public access along the water's edge of these parcels would clearly help in providing a more continuous and more easily understandable pedestrian system.

However, access through these stretches is of lesser priority than Group 1 parcels and not immediately necessary.

- A. South bank, west of Prospect Street Crossing private property behind historic Waltham Watch building.
- B. South bank, at Commonwealth Avenue (Newton) - private property behind Marriott Hotel.

Group 3 Parcels:

Acquisition or Status Change Not Recommended

For some of these parcels, acquisition would be extremely difficult or unreasonable in the case of residential ownership. In most cases, one or two alternative solutions exist: either public property is available on the opposite bank to provide adequate public access, and/or pedestrians can pass around the parcel on public land relatively easily.

- A. South bank immediately east of Bridge Street crossing - steep slopes.
- B. South bank, immediately west of Bridge Street crossing - face of Bemis Mill building abuts river (but good access behind mill - off California Street).
- C. North bank, immediately west of Bridge Street Crossing - private property and face of Aetna Mill building abuts river.
- D. South bank, west of Cheesecake Brook (Newton) - private residential ownership.
- E. South bank, east of Prospect Street (Waltham) slopes and private residential properties along Crescent Street with scenic easement.
- F. North bank, behind Ames Shopping Center (Waltham) - private property and steel crib/concrete walls abut river.
- G. Both banks - various residential properties in Waltham and Newton overlooking lakes.

Acquisition of property by the MDC is recommended only for the stretch of bank (1400 linear feet +/-) in Watertown between the ice rink and Stop & Shop. This is a particularly scenic stretch of wooded shoreline, and a critical link in pedestrian circulation between the MDC's Cannalonga Park and the Farwell Street bridge crossing.

Formal easements permitting public access, or informal agreements if possible, are recommended for Mt. Feake Cemetery, Longview Fibre, and the Brandeis University property in Waltham. These three properties are important for their unique scenery and/or are critical in promoting continuity of circulation through the Upper Charles. A formal easement will also be necessary for the River's edge of the Grover Cronin property at Moody Street in Waltham. Public access along the river has been negotiated with the new owner of this property called Cronin's Landing.

Habitat Reclamation and Enhancement

The following four strategies are recommended for improving wildlife habitat within the new Reservation:

1. Develop a Continuous Wildlife Corridor Along the River

A woody, vegetated buffer zone adjacent to the River and wetlands will provide essential habitat for wetland-associated species for use in feeding, roosting, breeding and rearing of young. This zone will also provide cover for safety, mobility and thermal protection. Such a buffer will also reduce adverse impacts of human disturbance and reduce sedimentation and excess nutrient flow to the River. For all of these reasons, new planting in the Reservation should seek to reinforce existing vegetation massing or create new continuous, densely vegetated corridors connecting parklands, forested

areas, or other open-space resources. Previously disturbed lands, such as those of past industrial encroachments should be revegetated as densely as possible with indigenous, woody plant material.

The shoreline of the Upper Charles does not show evidence of strong erosive forces. Most shoreline areas are protected and stabilized by a border of emergent vegetation and shrubs. However, in the few areas where the river bank is barren due to human disturbance, it may be planted with appropriate low shrub materials or be left open to provide views over the water and water access.

2. Improve Habitat Structure

Multiple layers of vegetation (trees, saplings, shrubs, forbs/grasses) support a greater diversity of wildlife than a simple tree overstory with a grass understory. Conifers are particularly valuable as they are currently sparsely distributed in the lower reaches of the River and provide winter cover. "Snags" are important habitat features for a variety of wildlife species including cavity nesters, and are generally unavailable in surrounding urban and residential areas.

Thus, to improve habitat structure, planting design should focus on providing multilayered vegetation containing a variety of native plant species which also produce mast or berries for wildlife consumption. Both deciduous and evergreen species of large trees, saplings, and shrubs should be included with a variety of sizes of plants. Existing snags should be left at the River's edge along with some fallen trunks and limbs to decompose. Minimize open and maintained lawn areas, especially adjacent to the river, where the already overabundant Canada Goose flourishes.

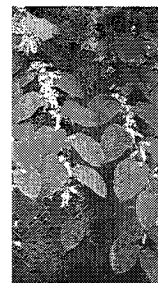
3. Reduce Plants Not Contributing to Habitat Value

Two types of plants in the Upper Charles which may lower species diversity are "exotic" species (non-native plants) and "opportunistic" species (native flora which have become overly invasive due to changed environmental conditions such as hydrologic disturbance or ground pollution). These plants lower habitat value by displacing the "normal" assemblage of plants required by wildlife for food, nesting and cover. Thus, a key Master Plan strategy involves the gradual reduction of these populations and replacement with a diversity of native species beneficial to wildlife.

A. Terrestrial Species

Since the use of herbicides to control problem species can be detrimental to some native flora and fauna, non-chemical methods, such as cutting, frequent mowing and reduction of regeneration using plastic matting should be given first consideration as management techniques. In some cases, these problem species are located in areas where radical removal may cause more ecological harm than good. For example, in steep bank situations where the plants stabilize the bank, prevent erosion, and provide some nesting sites, it is best to leave them alone but prevent further spreading along the bank.

Areas of Silver Maple swamp and Red Maple swamp that have a reasonably diverse plant community, and in which the natural hydrology has not been significantly altered, should receive extra attention to ensure that opportunistics and exotics do not continue to multiply. Target species would include Bittersweet vine, European Buckthorn, False Indigobush, and Japanese Knotweed. Some areas of Japanese Knotweed are located on rubble/filled soils. Soil quality will have to be improved, or native species will not colonize and flourish.



invasive plant

B. Aquatic Species

The Lakes District of the Charles River is a highly eutrophic (nutrient-rich) environment characterized by a dense proliferation of aquatic plants of many kinds—planktonic, rooted, floating, submerged and emergent—all of which have dramatically reduced access to boat traffic and shore fishing. The plant assemblage in the Lakes includes four major species: Water Chestnut, Fanwort, Eurasian Milfoil, and White Water Lily, of which only the last is a native plant. Although there are dense patches of Fanwort and Milfoil, Water Chestnut is by far the most aggressive invasive plant and, without control, will in time become the dominant plant of this River. The present nonnative community of aquatic plants is not desirable, ecologically or recreationally. As plant diversity rapidly declines, the aquatic habitat will continue to degrade.



A dense patch of non-native aquatic plants in the Lakes District.

Some success, although somewhat temporary, has been achieved in past treatment of Fanwort using "Sonar," a herbicide approved by the U.S. EPA for use with potable water supplies (treatment by ACT/Fugro East in Ware's Cove). However, it appears that Water Chestnut may only be controlled by repeated mechanical cutting and harvesting for several years. Thus, it is recommended that a regular control program be initiated using both herbicide treatment (Sonar) and mechanical cutting and harvesting. In addition, an annual survey of the

geographic distribution of dominant aquatic weed species would be advisable in measuring the relative effects of control techniques and directing future measures within the Lakes District. Only repeated programs such as these will eventually improve the aquatic habitat and increase the amount of open water for recreational activities.

Notwithstanding the above recommendations, the only truly effective, permanent solution to this problem is continued efforts to reduce or eliminate both point and non-point sources of nutrient addition to the river from human waste, fertilizers, bird populations, and other sources.

4. Improve Soil Quality

Adequate soil (or "substrate") quality is necessary for any of the above planting to be successful and durable. Much of the upper Charles River banks in the urban corridor have poor quality soil due to filling, compaction, introduction of pollutants, and general low fertility. Therefore, additional loam must be imported to the area, or existing soils must be enriched to replace excavated poor material and provide planting pits or entire beds of better quality. Without such soil improvement, restoration of these areas will not be sustainable.

Safety and Security

A number of analyses of new greenways and completed multi-use trails throughout the country have noted that public safety is lowest in areas where regular public surveillance is not possible and where public use is so infrequent that illicit activities go unnoticed. Parts of the Upper Charles River are this way today. Conversely, it has been demonstrated that visitor safety improves with increased use of a facility. Observation of activities and also the potential for observation by many users and abutters creates a safer environment. Thus, as the new Reservation is improved, its popularity spreads and use and surveillance increases, it will actually become safer than it is today.

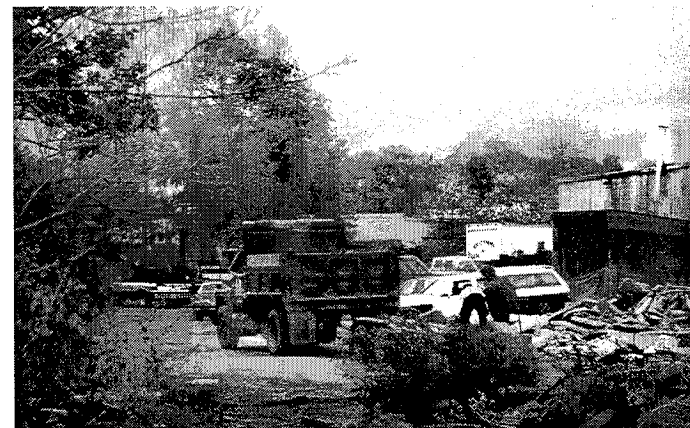


Bicycle mounted park rangers and police will be an effective means of insuring a safe public environment.

The MDC will actively promote this improved situation by providing park rangers to patrol the Reservation on bicycles and eventually lead tours on foot. In addition, the MDC is seeking arrangements with police from neighboring communities to join in the surveillance effort to insure a safe public environment. As with other MDC Reservations, the Upper Charles River Reservation will be closed to the public at night.

Encroachment on Public Land

Throughout the Reservation, MDC park land has been encroached upon by adjacent property owners.



Example of commercial encroachment where a business is storing equipment and dumping materials on MDC property

These encroachments fall into two general categories. Residential encroachments consist mainly of backyards or gardens that extend onto MDC property. Commercial and industrial encroachments consist of paved areas for parking and storing equipment, dumped materials, or fill from abutting properties. These encroachments result in misuse of MDC property and the land itself, inhibit circulation throughout the river corridor, and also limit access to the Reservation. To maximize public enjoyment and to restore the River's ecological health, all encroachments should be completely removed, and the land returned to a natural condition in accordance with the Master Plan's restoration strategies.

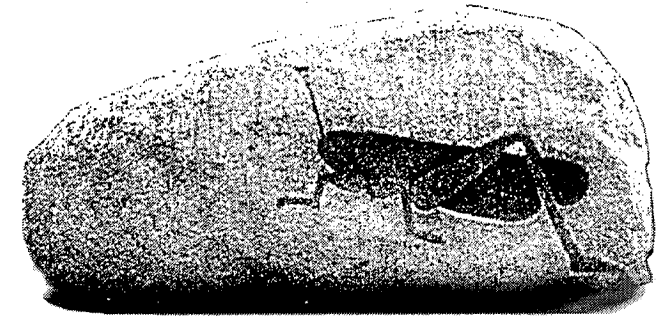
Interpretive Features and Signage

Interpretive features for the Upper Charles Reservation should focus on three major themes:

1. *The Natural River* - description of interesting flora and fauna; evolution of the River; vegetation and wildlife over time; fishing phenomena; unique natural features.
2. *The Settled or Industrial River* - story of early human settlements; transportation and industrial use of/changes to the River (i.e., dams, bridges, mills, etc.).
3. *The Recreational River* - evolution of the recreational activities on and along the River.

Interpretive programming should be structured for short-term, manageable actions as well as longer-term objectives.

Short-term interpretation will focus on special natural features (plants or animals) and on past alterations to the River's edges for industrial purposes. The form of this interpretation should be low-key, nonintrusive, suggestive and durable. For example, images of special plants or common animals can be etched in the surface of boulders positioned at stopping places along the path or at popular fishing



Example of etched images on the surface of boulders

spots. Small plaques can be installed in paving or set into walls describing how the river water was channeled at certain points into the mill complexes.

In the longer term, it is recommended that the three Visitor Centers expand their river-related services and take on a more active role in interpretive and educational programs. The visitor centers would have detailed maps or three dimensional models of the Upper Charles River on display. They would serve as gathering points for nature walks or historical tours by MDC park rangers. Historic photos and artifacts would be exhibited to illustrate the fascinating story of the River, from its original settlement, through the birth of the industrial revolution to the present.

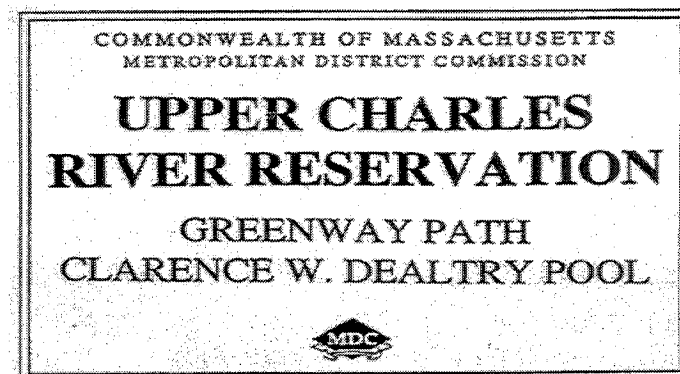


Interpretive features related to the "natural river" could serve as educational tools for nature walks.

In addition to a variety of materials devoted to environmental awareness, self-guided trail maps would be available for public use. Unique and interesting natural or man-made features would be keyed to numbers set into posts along the Reservation pathway. In addition to identifying individual features, the guide would include historical sketches aimed at introducing the visitor to the evolution of a region's culture set in motion by its river.

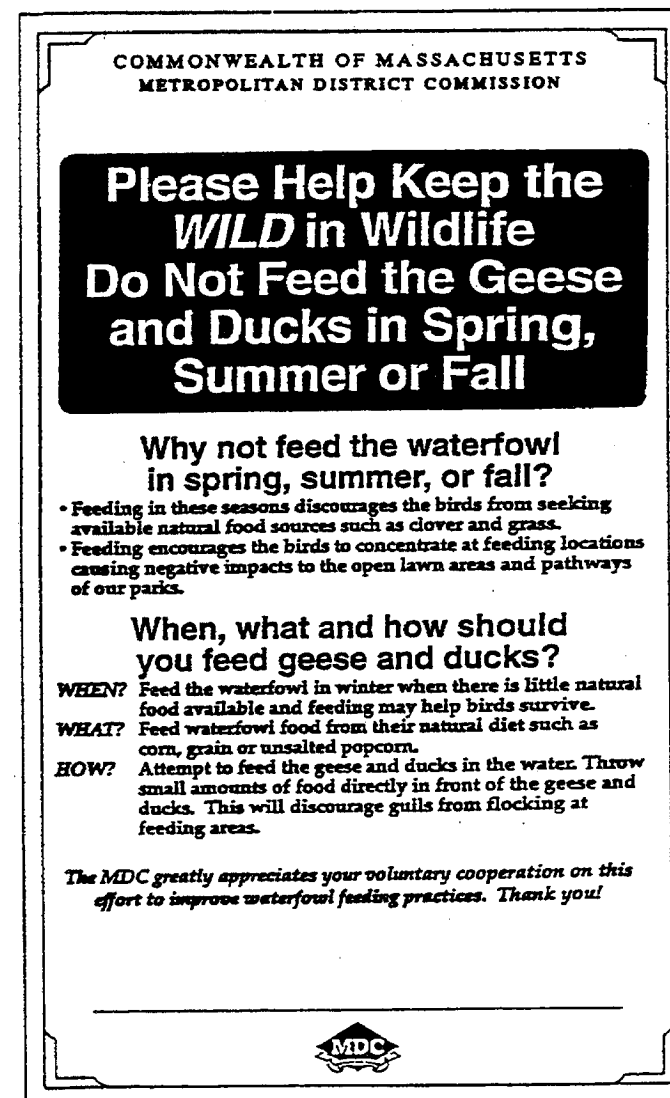
As mentioned above, the bridges over the River provide the best opportunities for display of interpretive information. Such displays will require coordination of efforts between the MDC and the bridge owner, typically the city, town, or the Commonwealth. To suggest pieces of the rich history of this corridor, subtle ways of illustration should be used wherever possible, rather than major signs. For example, in the sidewalk in front of the historic Waltham Watch Factory, one could embed a string of enlarged bronze watch parts (gears, levers, hands, numbers, etc.) indicating that this was the first factory to mass produce complete watch systems. Such playful implication can be combined with text to present history in a more delightful manner.

To reduce unnecessary maintenance and to intrude as little as possible upon this natural setting, new signage in the Reservation should be kept to a minimum. Appropriate signs are as follows:



Main entrance sign

1. Major MDC sign panels identifying the Reservation are proposed at each of the three primary visitor centers.
2. Small sign panels outlining key rules and regulations (e.g., no motorized vehicles, hours of operation, no alcohol or fires permitted) should be located at or near visitor centers and primary entries.
3. In selected River's edge locations, signs explaining policies for waterfowl feeding of should be posted.



Water fowl feeding sign

4. At both ends of lengthy, angled boardwalks, signs should be used to indicate that bicyclists should dismount and walk their bikes.
5. In several situations, due to lack of ownership or physical obstructions, visitors are forced to leave the River and proceed onto public ways arrow would direct people toward the pathway continuation. These would be particularly necessary in the Lakes District where MDC land is fairly discontinuous.

Due to the limited width of the asphalt pathway and boardwalks, the Reservation path will not be formally signed as a bike path.

Water Access and Use

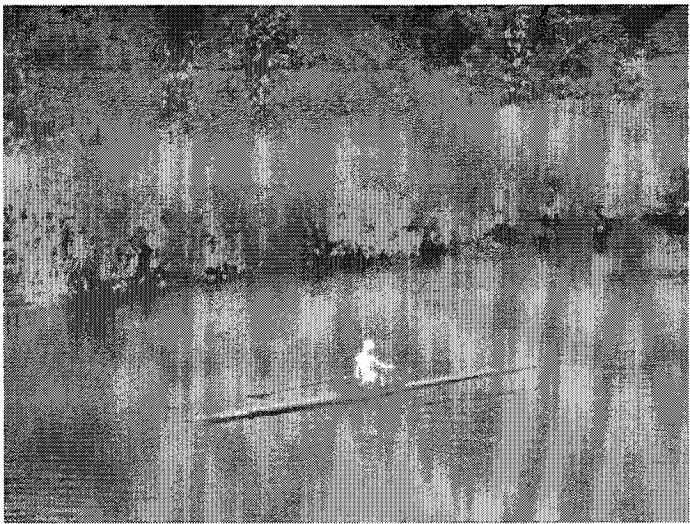
Canoeing, kayaking, rowing, power-boating, year-round fishing, and ice skating are currently the most frequent, and increasingly popular, water-based uses of the Upper Charles. Promoting these activities and the simple enjoyment of the River itself is a key goal of the Master Plan. Strategies to achieve this goal include improving visitor access to the water wherever possible, increasing visual access to the water to heighten awareness of its presence, controlling growth of invasive weeds such as Water Chestnut, and improving water quality to make water use of all kinds more safe and desirable.

Recommendations for developing these strategies are as follows:

1. Develop small "river access areas" in selected locations at the river's edge that are already worn from visitor use. These would consist of surfacing with granite river cobbles and installation of several large boulders to provide informal sitting within a few feet of the water. These areas should be "nestled" in vegetation and be connected to the main Reservation pathway via a soft-surfaced trail.

MASTER PLAN

2. Install viewing decks, or water overlooks, as part of the boardwalk system in selected scenic areas. These decks should get people out over the water to appreciate the River and will serve as fishing platforms as well. To heighten one's sense of being alone on the River, viewing decks should be located ideally so they cannot be seen from other viewing decks.
3. Improve and expand the Woerd Avenue boat launching area to make it efficient, inviting, safe, and enjoyable.
4. To give boaters of all kinds and fishermen adequate space, remove non-native, aquatic plants in the Lakes District by regular mechanical cutting and harvesting.



A boater on the Charles River

5. Increase the number of canoe access points throughout the river corridor and make portaging at dams as easy as possible. The above-mentioned river access areas can be used for this purpose. Improved landing/access points would include the MDC duck viewing area, the Waltham Pump Station site,

Forest Grove Park, Auburndale Park at Ware's Cove, the site at "Nuttings on the Charles", and Landry Park. Publish a plan



The Waltham Pump Station site, a good landing and picnic ground

- illustrating canoe access points and parking areas for the Upper Charles.
6. Improve visibility of the water by regular removal along the banks of aggressive, exotic vegetation such as Japanese Knotweed. Also, selectively thin river's edge vegetation at key points to improve plant health and open up views to the river.
7. Encourage towns to develop river viewing "niches" or overlooks on major bridges as described above under "Bridges".
8. Remove all paving encroachments within the Reservation and revegetate these areas to assist in filtering storm water run-off and thus improving water quality.
9. Increase the number of celebrated annual events on the Upper Charles, similar to the "Run of the Charles" canoe race and the New England Steam Expo. These might

include fishing contests, ice fishing demonstrations, guided ecological tours by canoe, historical tours by canoe, an Upper Charles photography contest, or a supervised Upper Charles swimming event to highlight water quality.

10. Continue to support the efforts of Charles West Boatlines which provides educational pleasure cruises between Moody Street and Commonwealth Avenue.

Notwithstanding all of the above items, as has been demonstrated in the past, the three things that will contribute most to future recreational use of the River are clean water, an adequate water supply in dry seasons and continued restoration and greenway development along the banks. The improving health of the River remains the controlling issue.

Segments of the New Reservation

As described earlier, this portion of the Upper Charles River Reservation has two different "personalities". Because of its narrow and sinuous configuration, the easterly part of the Reservation is referred to as the Greenway Corridor, beginning at Watertown Square and extending to the Prospect Street bridge in Waltham. The rest is known as the Lakes District, starting at the Prospect Street bridge and continuing to Commonwealth Avenue in Newton/Weston.

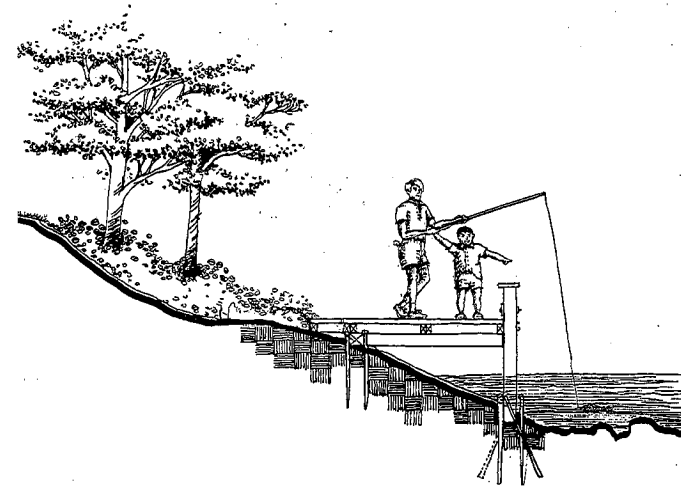
The Greenway Corridor

Along the Greenway Corridor, the Reservation is constricted by development along both its banks. This narrow, winding section of the river is bordered by lush vegetation, while dams and bridges punctuate the linear ribbon-like system. A number of historic mill buildings and other artifacts from earlier ages are scattered throughout this stretch. This part of the Reservation is particularly unusual: while it is narrow and densely settled, it maintains a surprising diversity of animals and plants.

The Lakes District

The Lakes District of The Upper Charles River Reservation is characterized by its rural experiences featuring expansive views, wooded coves, informal pathways, frequent wildlife sightings, and fishing and canoeing. Originally constructed in 1812, the Moody Street Dam flooded the upstream area, slowed the flow of the River and created this series of coves containing a scattering of odd-shaped marshy islands. While the River's edges in the Greenway Corridor are referred to as "banks", they are often referred to as "shores" in the Lakes District. For this section of the Reservation, the Master Plan aims to build upon and enhance its natural amenities, while

ensuring their long-term protection. In general, the pathway here will follow existing roads, paths and informal trails. New amenities will include more



Wooden piers may provide ideal access for fishing in the Lakes District.

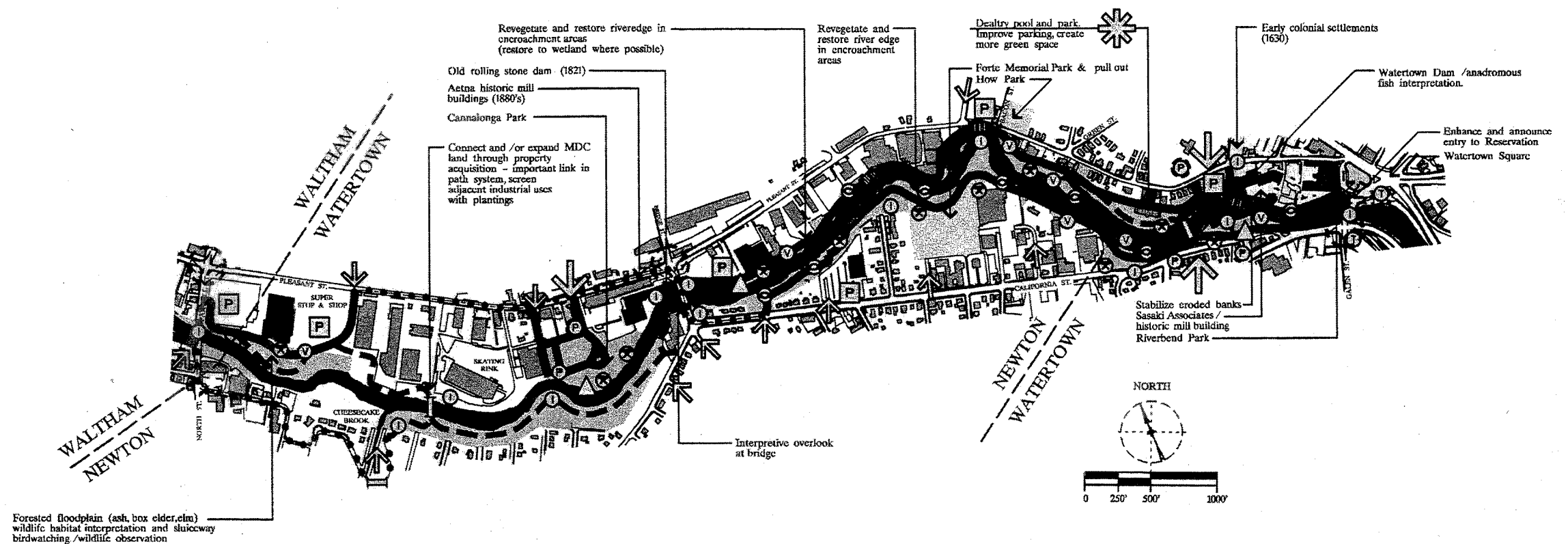
formalized fishing and canoe access areas, interpretive points (for both historic and natural features), picnic areas, as well as a visitor center at the Charles River Canoe and Kayak Center.

These two sections (i.e., Greenway Corridor and the Lakes District) can be further subdivided into six segments based on town property lines, adjacent land use and the character of the path system. The Greenway Corridor contains four segments: one on the North bank of the river, from Watertown Square to Farwell Street (the Watertown town line); a third extending from Farwell Street to Moody Street in Waltham on both sides of the river; and a fourth segment from Moody Street to Prospect Street on both sides of the river. The Lakes District contains two segments. Both extend from the Prospect Street Bridge to Commonwealth Avenue. One segment follows the northwest shore of the Lakes District, and the other follows the southeast shore.

The following descriptions will start with the easternmost segment in the Greenway Corridor, at Watertown Square, and continue westward to the last two segments in the Lakes District. The segments in the Greenway Corridor are as follows:



The Lakes District



Segment #1: Watertown Square to Farwell Street (North side in Watertown)

This segment offers the fullest array of experiences characteristic of the Reservation. The pathway commences at Riverbend Park in Watertown Square, extending the existing paved path westward. After a short distance, the bituminous pathway changes to a boardwalk behind the Sasaki Associates building at the Watertown Dam. Here, varying existing grades and wetlands prevent the use of a bituminous path. The boardwalk provides picturesque views of the dam, and includes a new decked overlook projecting out over the dam. This overlook offers long views up and down the river while the sound of the water captivates and soothes.

Leaving the overlook, the pathway proceeds past a new parking lot to the front of the existing Dealtry

Pool building. This area and the Pool facility will serve as a main entry and easterly visitors center for the Reservation. In addition to being easily accessible by car or foot from Pleasant Street, the center can be reached from the south side of the river via the Thompson footbridge just upstream of the dam. Inside the building, MDC staff will distribute trail maps, display aerial photographs of the Upper Charles, and provide space for gathering school groups and walking tours.

The entrance to the pool building will be more inviting with new pavements, planting, steps, seating walls and a path down from Pleasant Street. Linked to the pool's operating schedule, the center will be open primarily during late spring and summer when most use of the Reservation will occur. The pool complex, in its park-like surrounding, will be

enjoyable for picnicking, sunbathing, rest and other passive recreation.

The new parking lot will provide approximately 30 spaces for MDC pool and Reservation users only. The limited number of spaces will allow more planting and green space in this area, thus improving its appearance as a Reservation entry. Parking by anyone not using the pool or Reservation will be prohibited.

A canal once directed river flow through a paper mill complex at the site of this new parking lot. Presently, the complex is owned by Sasaki Associates. The historic use of this area will be marked by new stone walls built in the same approximate alignment as the historic canal walls. A small plaque set into the new walls will give visitors a sense of the early industrial use of the area.



Existing condition: between Sasaki Associates building and the river, looking west.

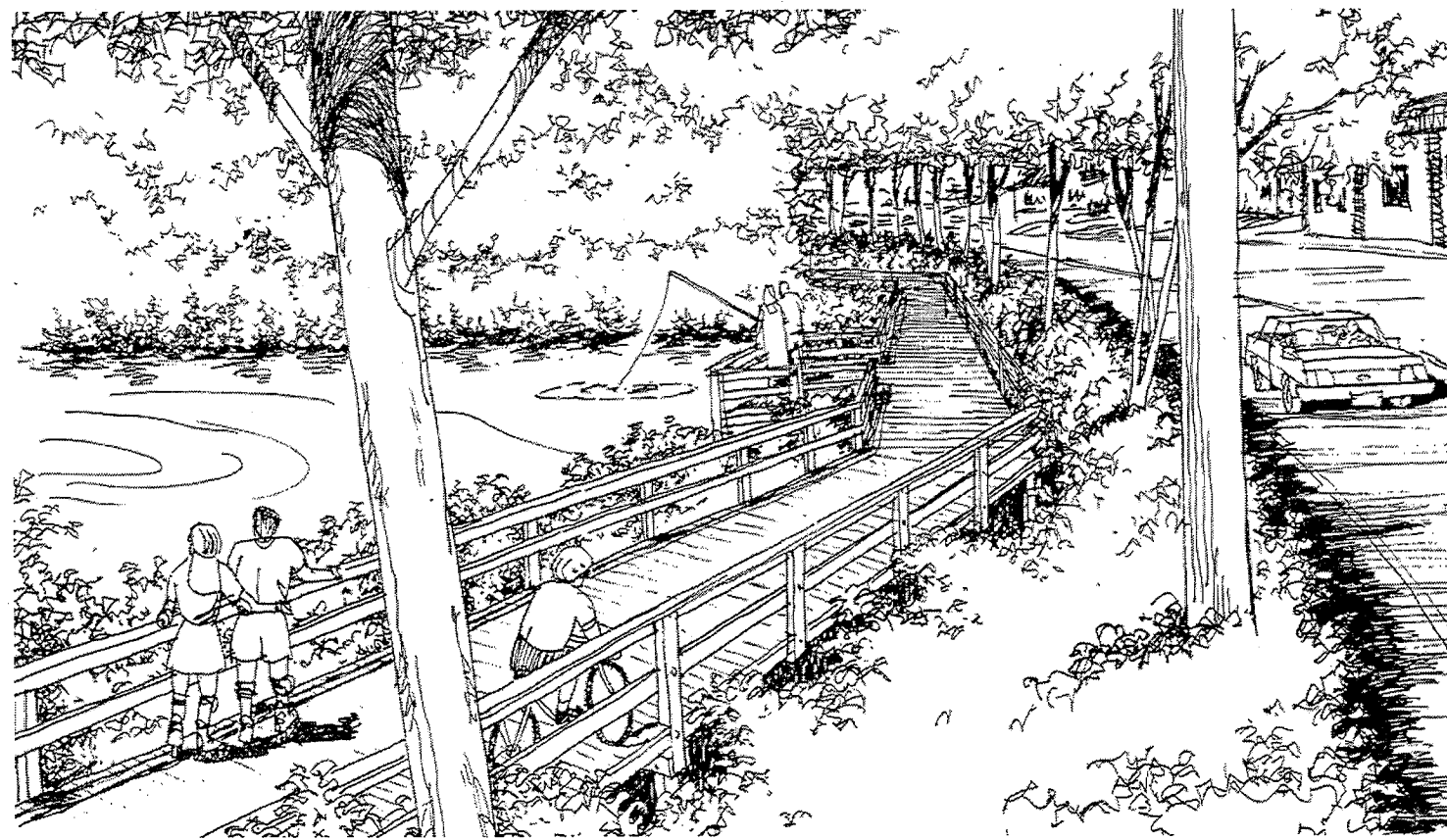
West of Dealtry Pool, the path passes through a relatively "wild" and thickly vegetated landscape for about 100 yards, before opening up into a low-lying area bordered by the backyards of several residences. A small pier is proposed for fishing and observing wildlife in this beautiful natural setting. Just upstream the river bends sharply close to Pleasant Street and passes behind the Hartz-Mason industrial buildings. A lengthy boardwalk will round this bend keeping visitors out of the wetland and away from the busy edge of Pleasant Street. To facilitate access to the Reservation, new pathways at each end of the



Existing Condition: Reservation adjacent to Pleasant Street in Watertown, looking west.



Proposed condition: showing new boardwalk leading to the Watertown Dam overlook



Proposed condition: showing new boardwalk that also may serve as the Pleasant Street sidewalk

boardwalk will connect directly to the sidewalk along Pleasant Street. Another deck with an overlook is proposed at the end of a promontory off the Hartz-Mason property. This will provide excellent views of the dynamic habitat across the river.

Beyond Hartz-Mason, the path passes by commercial properties all the way to Bridge Street. These areas will be reclaimed and revegetated, extending the wildlife corridor. After rising up to meet Bridge Street, the path will follow the existing Pleasant Street sidewalk two blocks west and reenter the Reservation through Cannalunga Park.

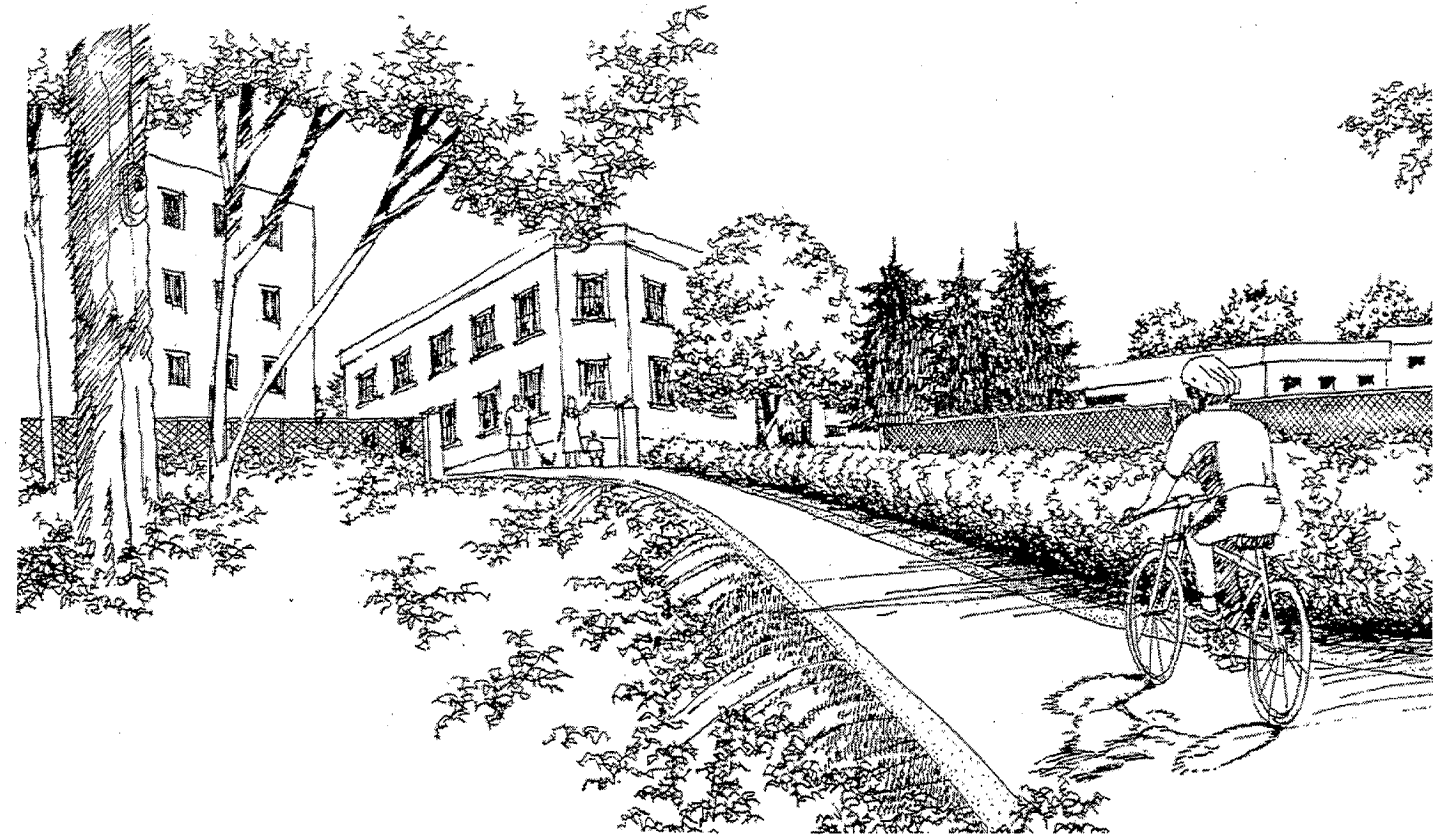
The MDC's Cannalunga Park contains a number of paths, tennis courts, benches, picnic facilities, and a wide grassy area by the River ideal for casual picnicking and canoe take-out. The existing path system continues westerly through the park to the back of the Watertown Skating Rink. A lushly vegetated, narrow strip of land opening into an Ash/Box Elder/Elm floodplain forest is between the



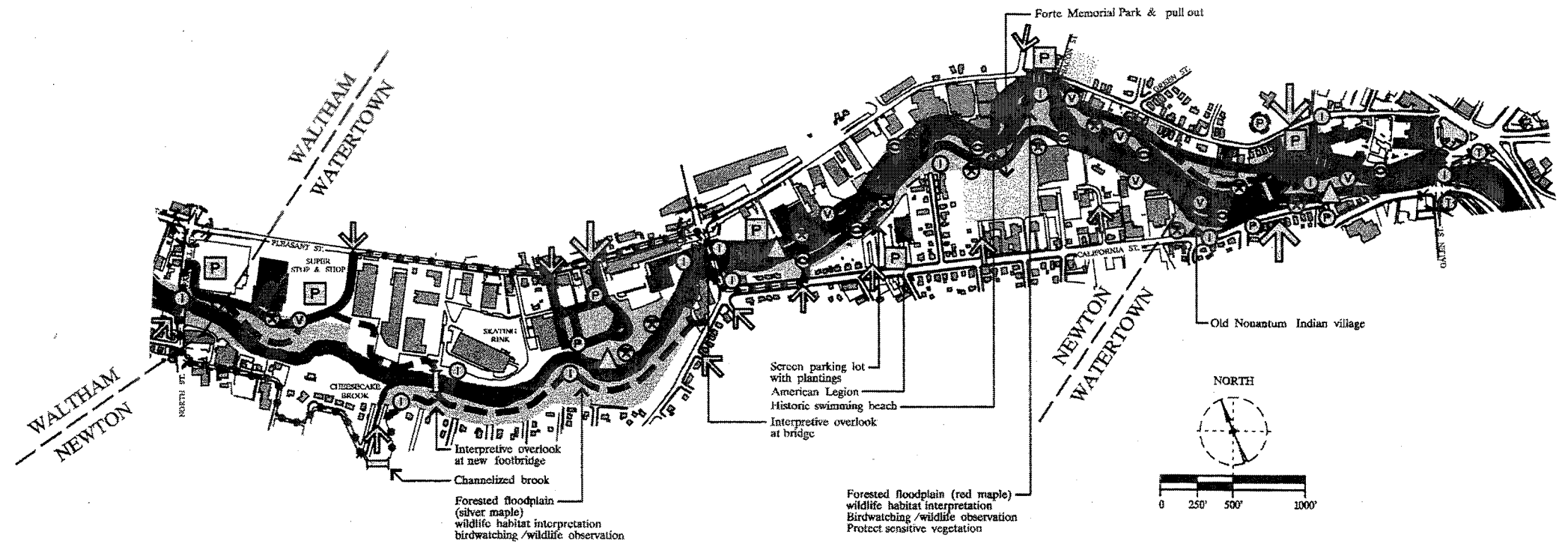
Existing condition: looking West from the riverbank up to the concrete wall at Bridge Street in Watertown

rink and the Stop and Shop property near Farwell Street. This important strip is not owned by the MDC and is highly recommended for acquisition to provide continued public access along the river. This is particularly necessary since there is also a break in public ownership on the opposite south bank at Cheesecake Brook. Since acquisition of residential property on the south bank is very unlikely, acquiring the edges of industrial lands on the north bank is essential for the new Reservation. With these acquisitions, the greenway can continue from the Skating Rink, all the way to Farwell Street. An existing pathway on the easterly edge of Stop & Shop conveniently links the Reservation path with Pleasant Street.

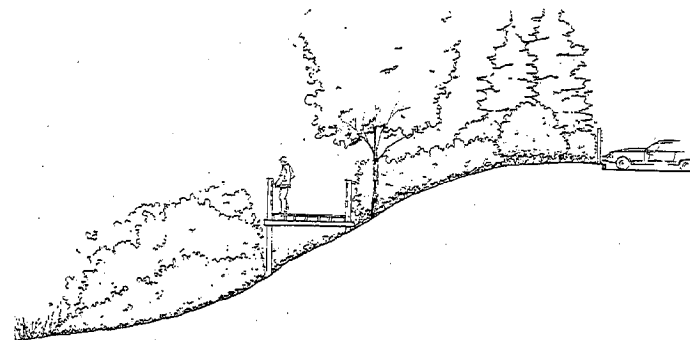
In Segment One, existing parkland, recreational facilities and historic resources are stitched together by dramatic, unspoiled scenery. The varied assets of this Watertown segment of the Reservation will always provide some natural or cultural treat to both new and regular visitors.



Proposed condition: showing the new pathway winding up to Bridge Street. The area in front of the concrete wall has been filled in order to allow the path to gradually rise to meet the sidewalk entrance at Bridge Street.



Segment #2: Watertown Square to Farwell Street (South side in Newton)



In order to minimize erosion and insure universal accessibility where the pathway traverses steep banks, it should be constructed as a boardwalk with a maximum slope of 5%. Additional planting should be used to improve habitat.

Visitors may enter the Reservation on the south side of the River from Watertown Square off California Street, just east of the Newton/Watertown line. A bituminous pathway will enter the Reservation from the California Street sidewalk in Watertown and continue west adjacent to several commercial properties. A half mile from the entry the visitor comes upon a beautiful Red Maple forest on the wide, low peninsula adjacent to Forte Memorial Park. The new bituminous path will closely hug the MDC property line here, while an informal path makes a shallow loop through the forested floodplain peninsula. The main path will continue west of Forte Memorial Park to the base of a steep embankment. A sloped boardwalk will take

visitors up this bank. A boardwalk will cause less impact than grading for a paved path, and also simplifies meeting standards for public accessibility. At the top of the embankment, adjacent to the American Legion Hall, the path continues west behind several residences before emerging at California Street just east of Bridge Street. The pathway continues westerly for 500' on the existing public sidewalk to Bridge Street.



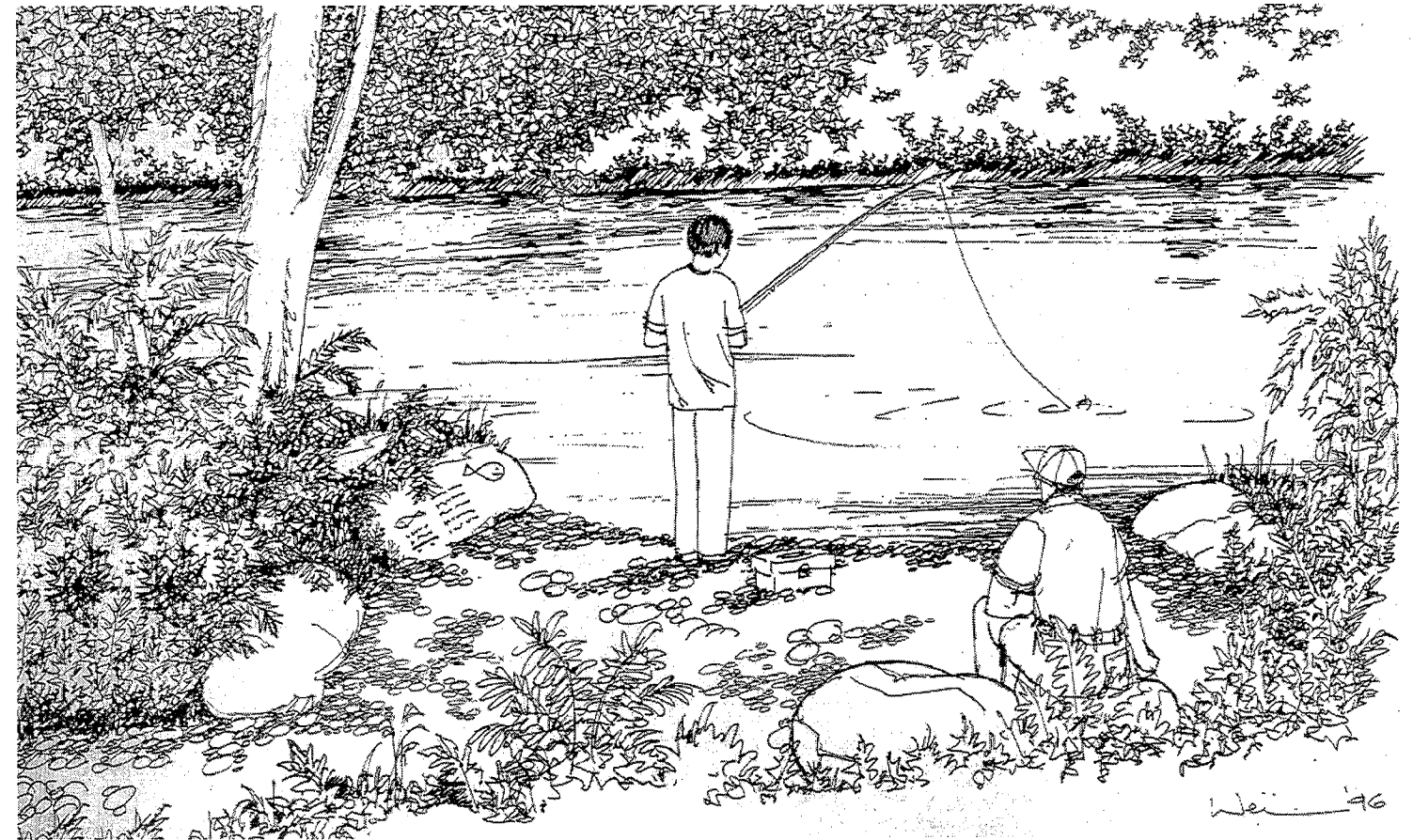
Forte Memorial Park



Existing condition: typical fishing spot with compacted and / or eroded river bank

Once across Bridge Street, visitors can return to the river corridor once again behind the historic Bemis Mill and Dam complex. Here a new stabilized soil path will follow an existing trail that will wend through a dense silver maple forested floodplain for almost half a mile. Where Cheesecake Brook enters the Charles, one will be able to cross the river over a proposed footbridge and continue westerly on the north bank, or continue west on existing sidewalks and local streets toward Farwell Street. Private residential property just west of Cheesecake Brook, as well as steep slopes further along, prevent direct public access on the south bank to Farwell Street. However, crossing the River via a footbridge would allow visitors to reach the Farwell St. bridge along the pathways on the northern bank.

There are two unusual forested floodplain wetlands within this segment of the Reservation, affording great opportunities for birdwatching and wildlife habitat study. As mentioned above, the first wetland is found on the wooded peninsula adjacent to Forte Memorial Park in Newton. Red Maple is the predominant tree type here, providing excellent nesting habitat. A small unpaved Pruning and trimming existing vegetation and the addition of a low wood railing will better define the pathway and encourage users to stay on the path. Two



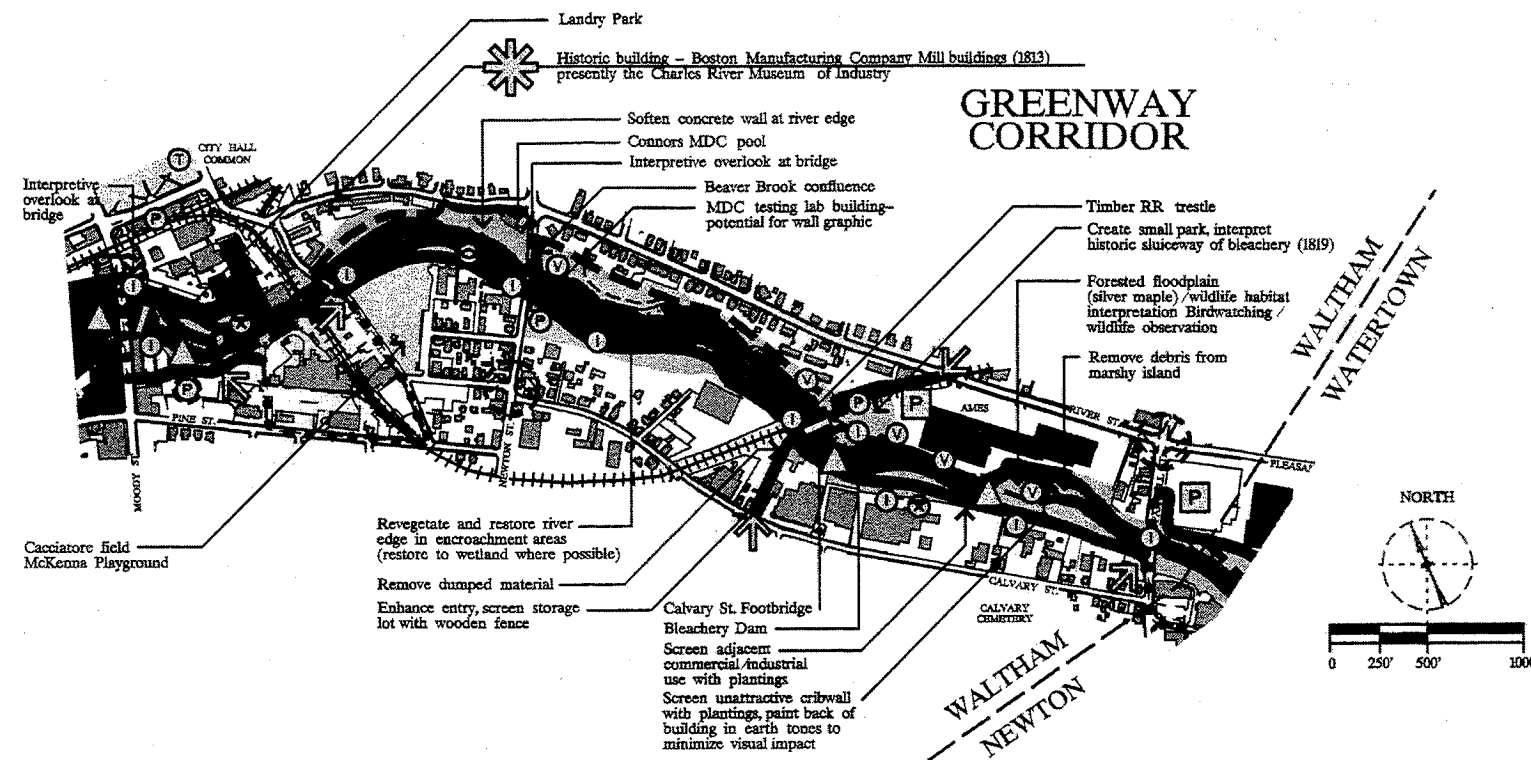
Proposed condition: showing improved riverstone surfacing and additional boulders

improved fishing spots will be located on either side of this peninsula at the water's edge. Another forested floodplain, dominated by a Silver Maple tree canopy, stretches almost the entire way from Bridge Street to Farwell Street in Newton. This linear woodland has a wilderness feeling, with large trees and a dense shrub layer. An unpaved path is proposed to extend the length of this woodland.

Forte Memorial Park, off of California Street and west of the Red Maple peninsula, is a key existing recreational facility abutting this segment of the Reservation. The athletic fields of this Park provide a number of community recreational opportunities. The Park is being improved by the City of Newton and, in addition to sports fields and courts, will include an exercise path connecting the park to the proposed Reservation pathway. The Master Plan recommends that the Reservation

property abutting the park remain open, providing opportunities for resting, picnicking, and viewing Park athletics. The intent is to encourage interaction between the Reservation and the Park as significant, related community resources.

Contained within a narrow corridor, Segment Two in Newton and Watertown has remarkable natural scenery and abundant wildlife comparable to many of the more well known open spaces in Massachusetts. The new Reservation pathway will allow visitors to quietly experience these wonderful riches.



Segment #3:
Farwell Street to the Moody Street Bridge
(Both sides in Waltham)

This segment extends from Farwell Street to Moody Street in Waltham where the dam marks the division between the placid water of the Lakes District and the more active flow of the river downstream. Whereas pedestrian circulation along the river in Segments One and Two is relatively continuous, in this segment pedestrian routes are a bit more interrupted by bridges, dams, and trestles across the river. This segment feels somewhat more active and populated due to the many crossings of the river by foot, automobile, and rail.

Between Farwell Street and the Calvary Street Footbridge near Ames, the new Reservation path will only extend along the south bank of the River. On the north bank behind the shopping center, a very steep concrete cribwall prevents the placement

of any path between the building and the River. Although the Ames building is large and prominently displayed on the River, across from it is a low-lying floodplain densely forested by Silver Maple. This very special and undisturbed wetland area is frequented by Black Crowned Night Heron who use the tall tree canopy here to roost. The sight of these magnificent birds underscores the wild and isolated character of this landscape which somehow coexists with the shopping mall across the River.

Upstream of the forested floodplain, abutting Boston Edison's property, is quite a different landscape. Currently, this area is dominated by a "grove" of high utility poles used for training Edison's employees in climbing techniques. The poles will be removed and this wide expanse of land reclaimed as Reservation parkland (see before and after image on the following page). The inland edge will be revegetated with naturalized, multilayered plantings to create new wildlife habitat. Because of the width

of this parcel, some grassy openings will also be interspersed here in more typical parkland fashion for use in picnicking, playing frisbee, sunbathing, etc. From this area there are picturesque views of the Bleachery Dam a large timber railroad trestle with a footbridge in its foreground. A canoe take out and fishing area are planned just upstream of the dam, and a canoe launch area is located a few



The Bleachery Dam



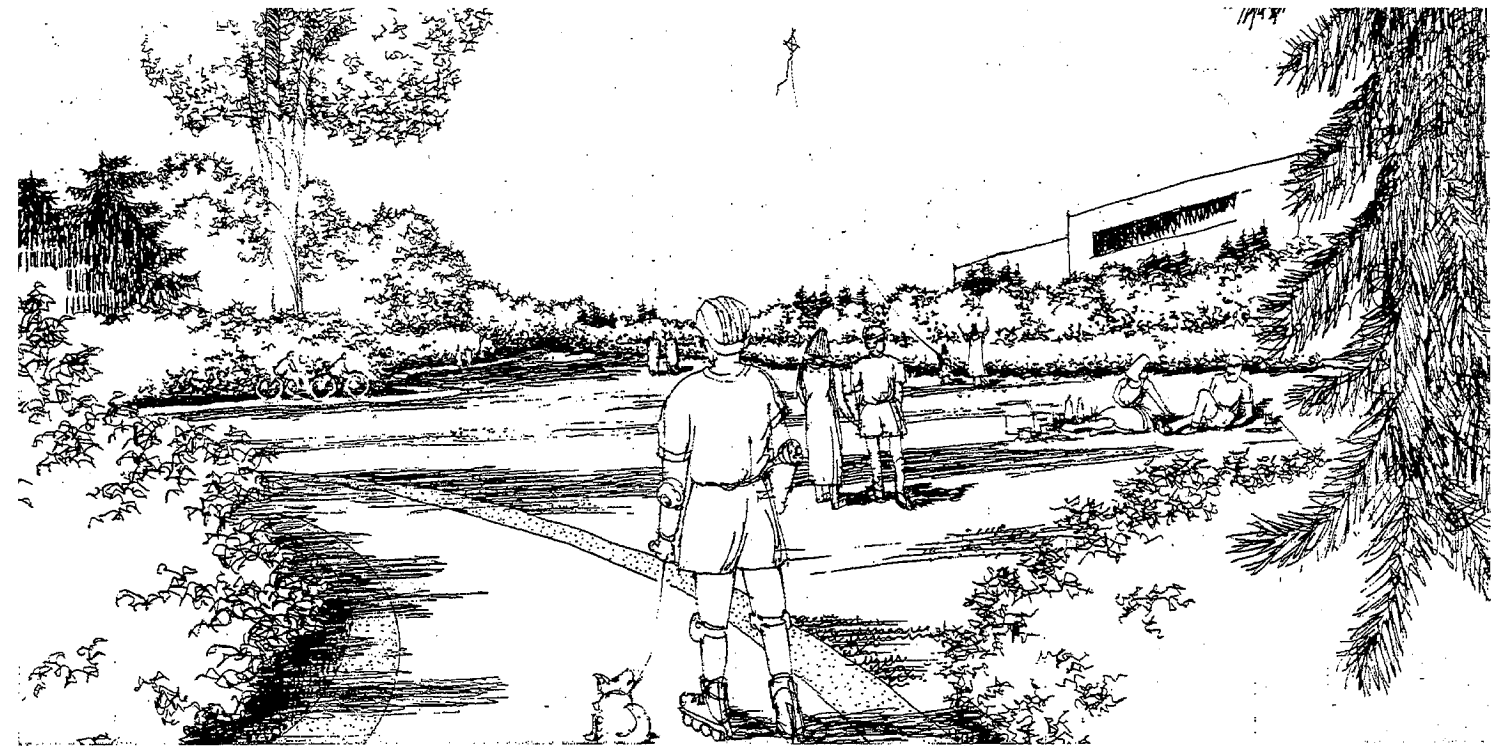
Existing condition: view of Boston Edison training ground for utility pole climbing

yards downstream.

After skirting the upland edge of the forested floodplain, the Reservation path will run through the middle of the restored training pole area and intersect with a Waltham walkway. This walkway travels over a footbridge and connects Calvary Street to River Street. Across the reconstructed footbridge, on the northerly edge of the River, will be a small new park adjacent to the Ames shopping center parking lot. This park and the Ames site were occupied as early as 1819 by the Waltham Bleachery, the first bleachery and dye works in the country. The existing granite pier in the middle of the River once supported another footbridge by which people walked to and from work each day for many years. The small park also contains stone remnants of "sluiceway" walls which once channeled



The unspoiled beauty of the forested floodplain



Proposed condition: showing new pathway and picnic area after removal of utility poles

water into the works. The new park will serve as a quiet terminus off the footbridge, providing several sitting areas oriented towards the River and the dam, as well as interpretive materials regarding the interesting history of the site.

From either end of the footbridge, Reservation paths will proceed westerly along the river toward the Newton Street bridge. The feeling of the walks differs greatly in this stretch since the northerly side of the river is primarily residential, while the southerly side has mixed commercial and industrial properties abutting the Reservation. Approaching Newton Street, on the south bank, the path will pass by the small MDC testing laboratory which is proposed to have a playful mural painted on its blank side depicting special wildlife and plants found along the river. After crossing Newton Street, still on the south side, the pathway will wind its way back down into the riverside vegetation. On the north side, the path turns inland around the confluence of Beaver Brook before meeting Newton Street across from the MDC's Connors Pool facility. After passing around the pool complex, the path will follow the River up

to Elm Street. Due to several steep slopes and mill buildings at the river's edge, passage beyond the Elm Street Bridge is impossible, and visitors must cross the bridge to the south side to proceed. McKenna Playground, one of the major community parks along the Reservation, is located on the south side of the bridge.

West of Elm Street, following the south side of the River, one will cross a refurbished wood footbridge into Landry Park nestled beside the Moody



The Museum of Industry will serve as a visitor center for the Reservation

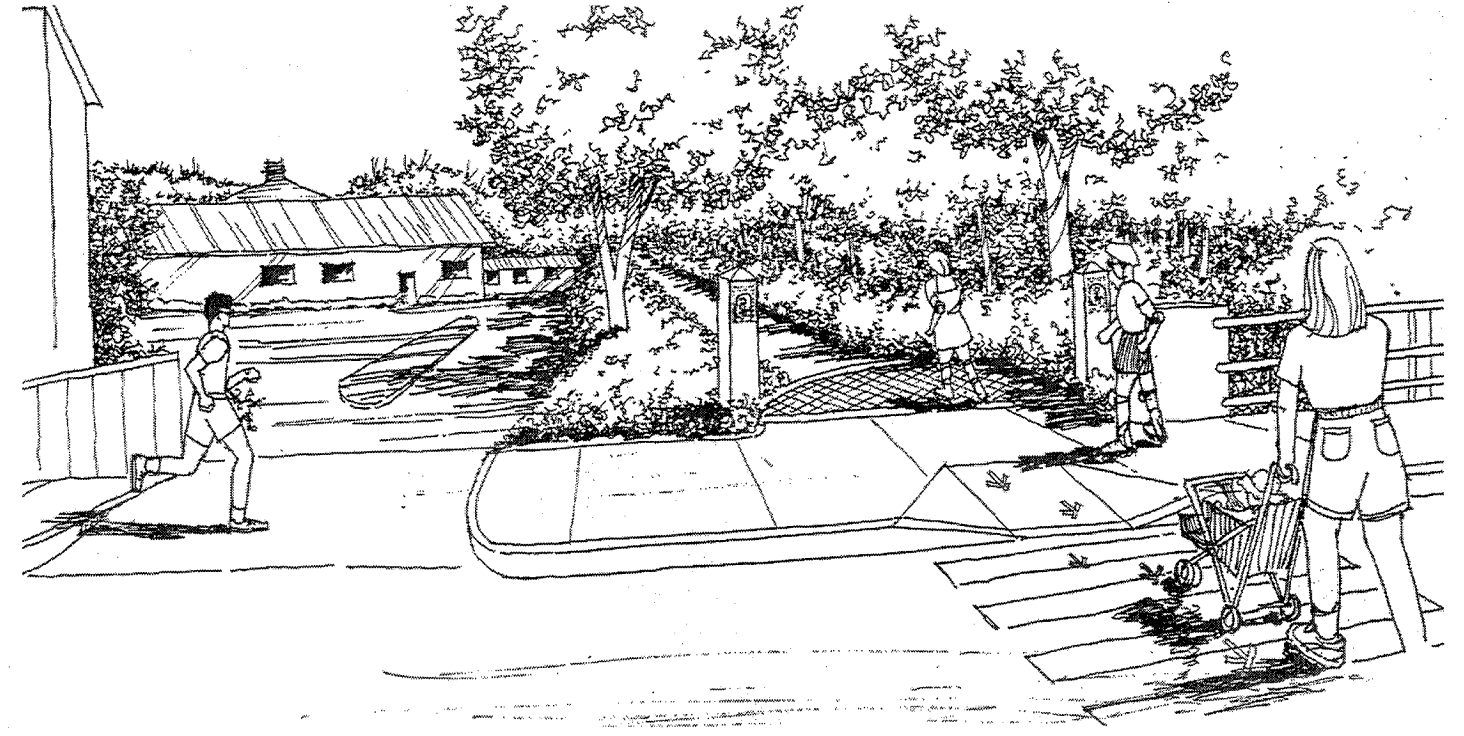


Existing condition: view looking west at the south side of the Newton Street bridge in Waltham

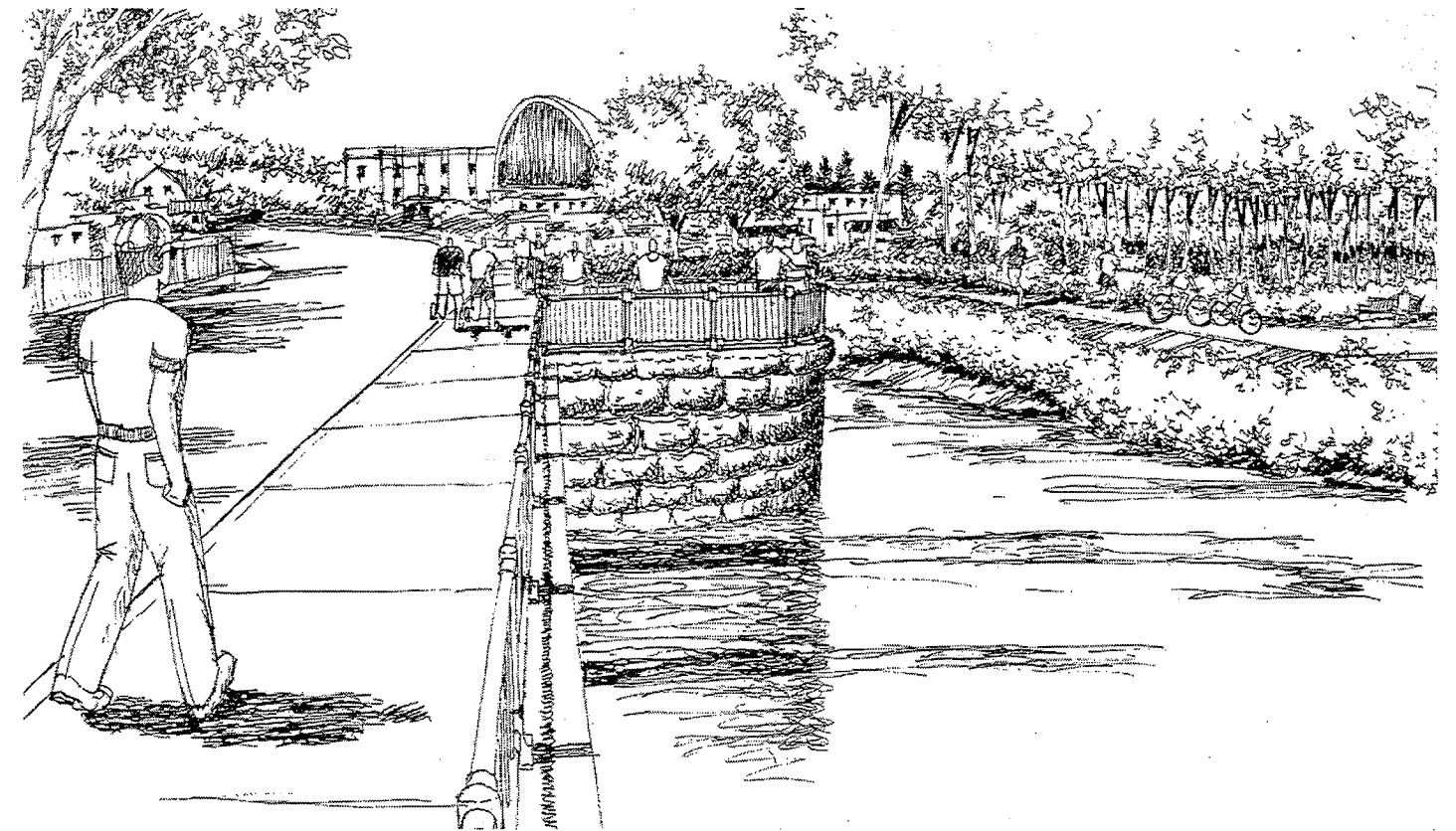
Street dam. Although in need of a facelift, the park offers excellent views of the dam and fish ladder as well as a picnic area and a walkway to the Charles River Museum of Industry. The Museum is located within the original Boston Manufacturing Company building which was the first textile mill in America. Through a variety of artifacts and programs, the museum tells fascinating stories about how the Charles River powered so much of our country's early industrialization. The Museum is proposed to become one of the three visitor centers for the MDC's Upper Charles River Reservation. Public parking is already available for the museum on the south side of the river, and its well-advertised mission is already closely tied to the river. Complemented by a renovated Landry park and repaired fish ladder, the Museum/Dam complex is, by itself, an exciting place to visit and will provide a fitting introduction to the new Upper Charles Reservation.



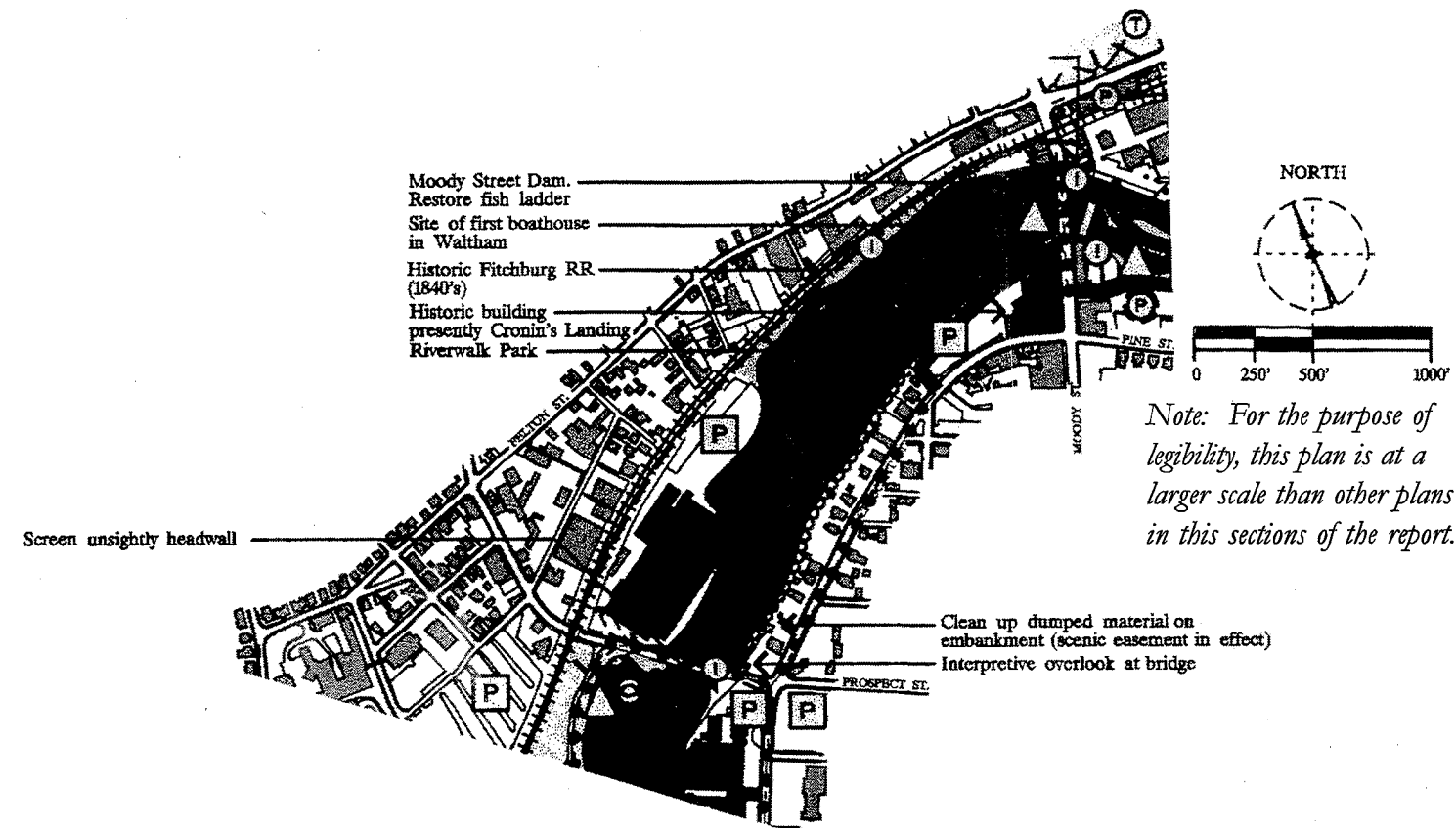
Existing condition: view of the east side of the Newton Street bridge with semicircular stone abutment



Proposed condition: showing new crosswalk on Newton Street leading to Reservation entrance next to the bridge railing



Proposed condition: showing railing extended around stone abutment making it useful as a viewing platform and stopping place with interpretive information



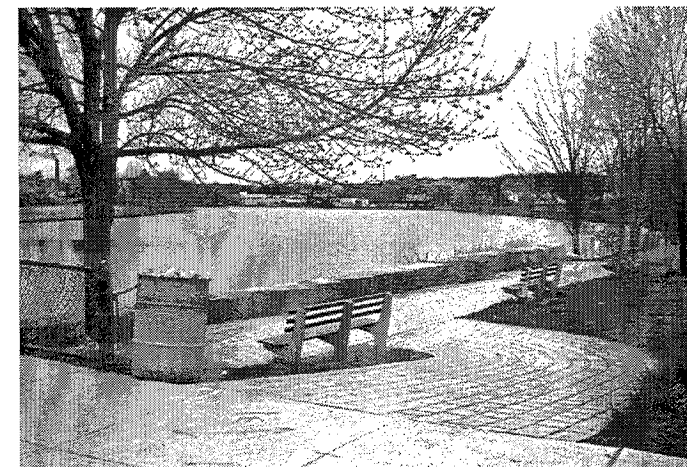
Segment #4: Moody Street Bridge to Prospect Street Bridge (Both sides in Waltham)

This short stretch in Waltham is a transition piece between the more developed river corridor downstream and the pastoral Lakes District beyond the Prospect Street bridge.

The entire north bank in this segment consists of Riverwalk Park, a landscaped pathway developed by the MDC in 1991. The City of Waltham paid for the design and Novo-Biomedical Eng. contributed a key land gift to this park development. Although clearly not very similar in character to the rest of the more naturalistic Upper Charles Reservation, this park serves as an important open space link for continued public access along the river corridor. The south bank is mostly privately owned by residential abutters and the Grover Cronin parcel at Moody Street.

Although the appearance of much of the wooded

south bank is protected by a scenic easement, public access can only be achieved along Crescent Street paralleling the River. The easterly end of this Segment is an exception since an easement for a public walkway along the river's edge is planned as part of the development at the Grover Cronin site. This is one more example of private abutters contributing to the MDC's efforts to develop a

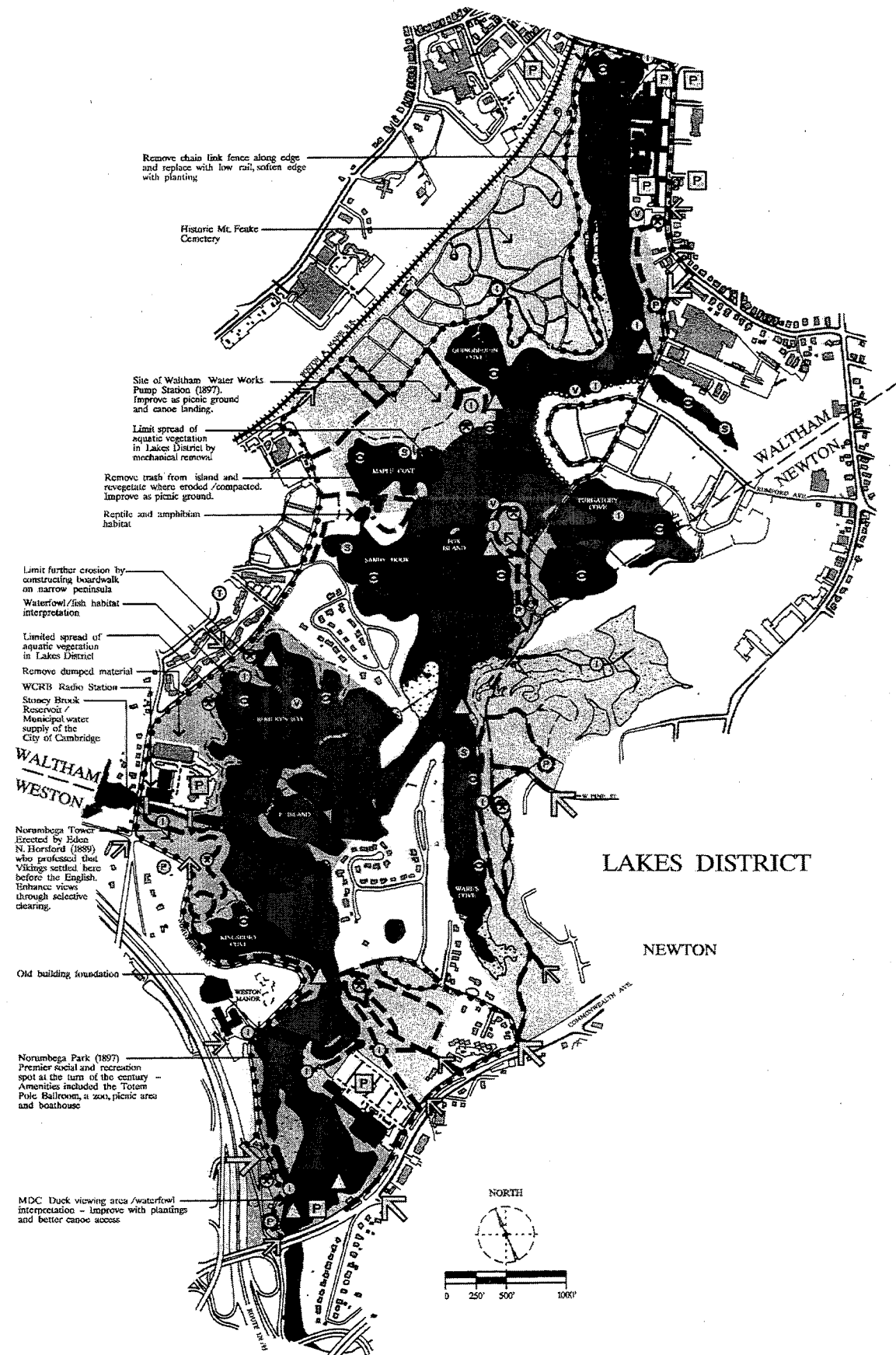


Existing condition: view looking west at entry to Riverwalk Park from Moody Street sidewalk

continuous Charles River greenway.. Such cooperation and generosity from adjacent owners has, and will continue to, play a critical role in the overall success of the greenway development program. Contributing to the public activity at this site is the landing dock for the "Totem Pole," the delightful tour boat which conducts narrated excursions up the Charles to the Lakes District.



Proposed condition: showing typical granite pillars added to give a more formal entry feeling



Segment #5: Prospect Street Bridge to Commonwealth Avenue (Northwest side in Waltham/Weston)

A myriad of existing paths and trails trace the undulating shoreline along this northwest section of the Lakes District. The Reservation path system along this stretch will follow the existing paths and roads as much as possible. In many cases, these paths require only slight improvement to serve more intensive public use. Where new pathways are needed, stabilized soil paths are recommended to retain this woodland setting.

A critical Master Plan recommendation for this segment is that public access easements be obtained for two major properties along the River: Mt. Feake Cemetery and the Brandeis University property between Maple Cove and Sandy Hook. In this way, approximately 95% of the shoreline in this section of the Lakes will be accessible to Reservation visitors. The only remaining shore not available for public use will be the string of residential lots lining the peninsula between Sandy Hook and the easterly edge of Roberts Bay.

Our description of this segment begins at the

Prospect Street Bridge. Looking over the water from the bridge, one notices the pattern of numerous pilings emerging from the water. These are remnants of the original foundations of "Nuttings on the Charles," a popular dance hall which featured music and dancing over the River just after the turn of the century. A new canoe launch and fishing deck are both proposed at this site. It is also an ideal location for interpretive graphics or public art



Pilings are remnants of the "Nuttings on the Charles" dance hall



The trail system on Brandeis University property is shaped by its unique landforms.

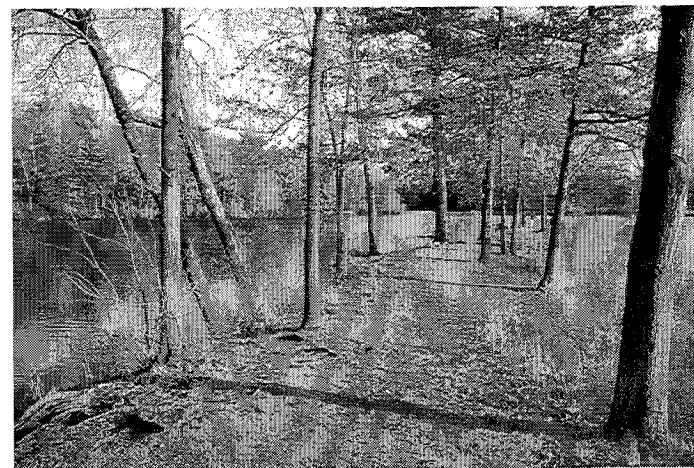
which would suggest the different and more romantic earlier use of the river. From Prospect Street, visitors pass through the classic landscape setting of Mt. Feake Cemetery. Its high points and scenic promontories provide unequalled panoramic views of the Lakes District and its surrounding communities.

On the opposite shores of Quinobequin Cove is the historic Waltham Pumping Station Site (1897). This site will also provide a critical link in the trail system for this side of the Lakes. The character of this peninsula is park-like with a broad, flat area near the River's edge lined with tall trees. The Master Plan proposes that the site be improved as a major riverside picnic ground with fishing access and a rebuilt edge for easy canoe landing. This is an ideal place for families arriving by canoe to spend an afternoon picnicking and exploring.

Between Maple Cove and Sandy Hook, another peninsula offers excellent recreational opportunities. The main portion of this peninsula is owned by Brandeis University and has an existing MDC conservation easement restricting its development. It is recommended that public access be permitted on this property since it affords so much opportunity in the way of passive recreation and education. The topography is varied and interesting, consisting of kettle holes and eskers, land forms shaped by ancient glacial activity. The trail system wanders in and around these landforms, offering rustic experiences,

and opportunities for wildlife observation and interpretation of natural systems.

Further south, a narrow peninsula juts into Robert's Bay off the grassy plateau on Charles River Road. From this narrow spit of land, a significant portion of the southerly Lakes District can be seen, particularly the forested banks on the opposite shoreline of the Bay. At the edges of the Bay, waterfowl can be observed fishing amongst the marshy islands. The peninsula is very eroded from extensive foot traffic, leaving extensive tree roots exposed. A boardwalk is proposed for the entire length of this popular spot in order to protect the ground surface from further erosion and help protect



Erosion and compacted soils on heavily used peninsula in Roberts Bay

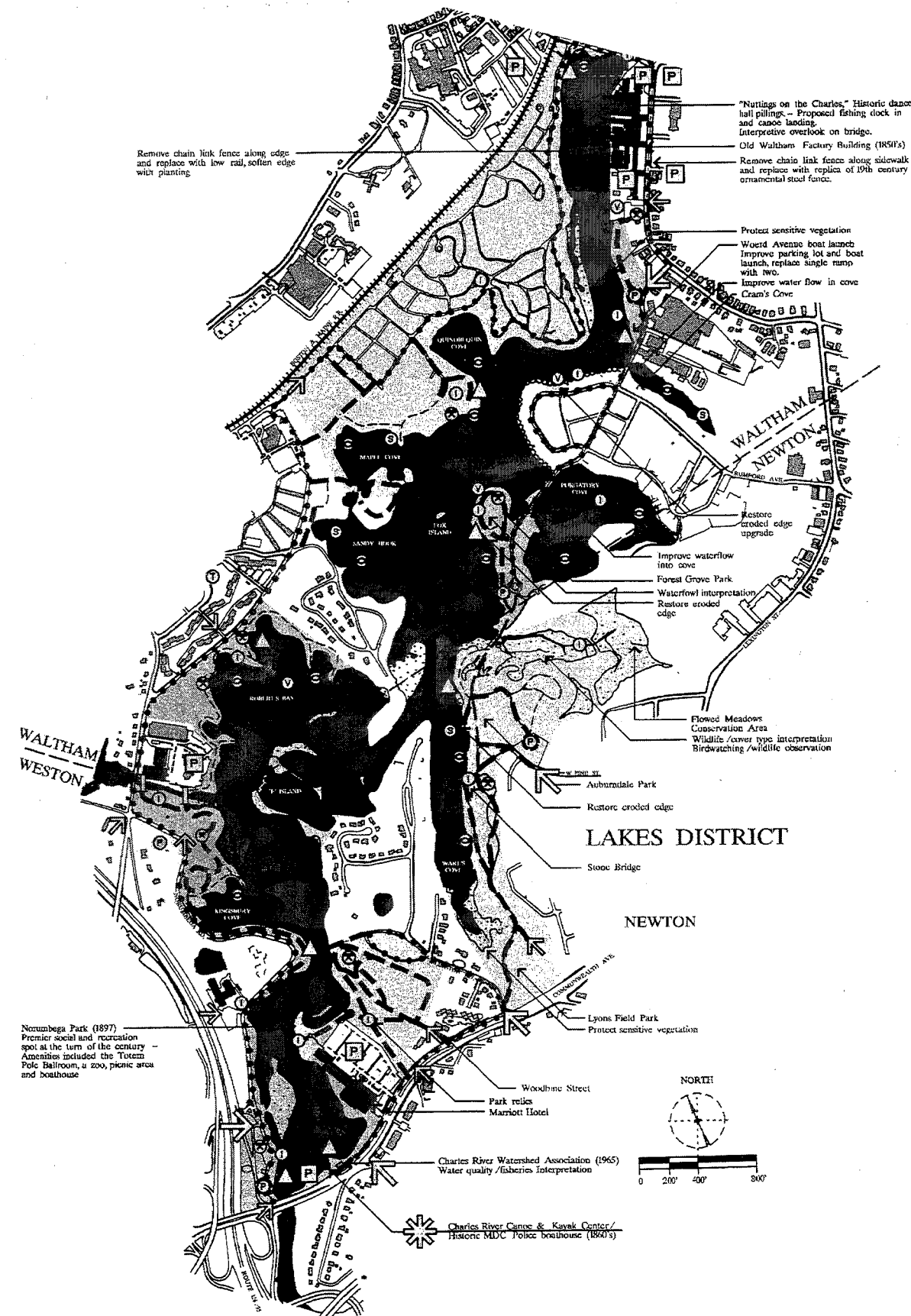


The picturesque shoreline of Roberts Bay

the existing trees from further degradation.

Continuing along the shoreline, one always passes several optimistic fisherman on the cove edges. After crossing a proposed footbridge over Stony Brook, an explorer will discover an interesting historical feature, the Norumbega Tower, dating to 1889. Standing 110 feet high, this tower marks where the original Viking explorers are said to have built a fort many years ago. The tower stands on a promontory near Norumbega Road just south of Stony Brook and could afford spectacular views over the entire Lakes District from its highest point with some extensive clearing of existing vegetation. At the end of this segment where the Lakes meet Commonwealth Avenue is the MDC's Duck Feeding Area. Parking is available and children of all ages are seen viewing and feeding the waterfowl. The MDC encourages feeding of waterfowl only during winter months when there is a shortage of normal food supplies. This area also serves as a canoe launch for those bringing their own boats to the river, and for parking for the Charles River Canoe and Kayak Service across the river.

Activities along the path system throughout the Western portion of the Lakes District are appropriate for the setting and include walking, jogging, wildlife observation, picnicking, canoeing, fishing and ice fishing, skating, and cross-country skiing.



Segment #6: Prospect Street Bridge to Commonwealth Avenue (Southeast side in Waltham/Newton)

A number of existing recreational parks and trail systems already exist along this segment. The Master Plan recommends upgrading existing facilities and paths and maximizing existing recreational opportunities. Leaving the Prospect Street bridge, one's first encounter is the historic Waltham Watch Factory which faces directly on the River for its entire length. Although an impressive and beautiful brick complex, it prevents public access to the River's edge for a significant distance. If the steel picket-fencing and the site on the street side of the building were renovated and interpretive materials added, this could become a fascinating and informative stop along the walk around this side of the Lakes. Upstream from the Watch Factory is the Woerd Avenue boat launch in Waltham, the only motorized

boat launching facility within the Lakes District. It is recommended that this well-used facility be upgraded by improving the parking lot and launch and replacing the single ramp with a double ramp. The launch is also an important public place for putting canoes into the river on the east side of the Lakes.

Forest Grove Park, west of Purgatory Cove in Newton, is a mitten-shaped peninsula affording wonderful views of the wooded shores on the opposite side of the River. This scenic park in Waltham is the only area in the Lakes District with predominant coverage by mature evergreen trees. Immediately south of Forest Grove, Auburndale Park/Lyons Field Park and Flowed Meadow abut Wares Cove in Newton. These parks and open

spaces are owned and managed by the City of Newton and provide a number of different recreational opportunities. Flowed Meadow Conservation Area is a highly productive wildlife habitat consisting of deep marsh, shallow marsh, meadow, wooded swamp, and a wide variety of upland habitat types. Birdwatching and wildlife observation are encouraged here, and existing interpretive displays add to one's understanding of the habitats.

Auburndale Park offers many outdoor experiences and a variety of trail types which include a narrower mulch trail following the shoreline along Wares Cove, wider trails inland and a fitness/ jogging trail equipped with exercise stations. These well-established trail systems and other associated amenities such as playgrounds and ballfields serve the public well throughout this edge of the Lakes District. To compliment these, the Master Plan suggests creating or upgrading fishing access areas, canoe launches, and picnic areas.

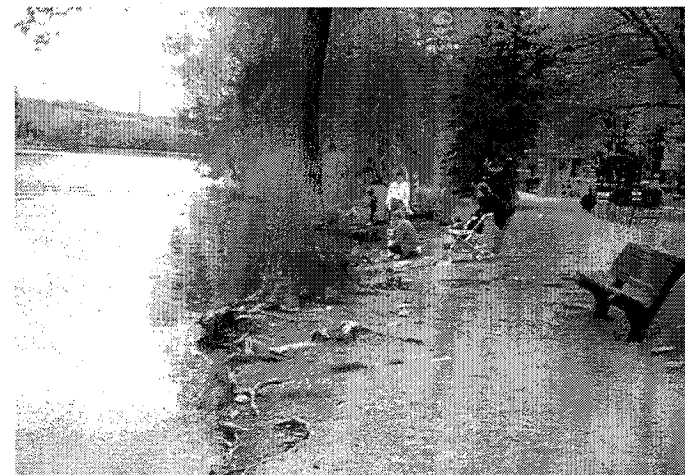


Existing pathway in Auburndale Park

Norumbega Park, also owned and managed by the City of Newton, is located just north of the Marriott Hotel and provides a pleasant setting to illustrate the historic recreational uses of the River in this area. This park was a premier social and recreational destination at the turn of the century,

attracting people from all over the Boston Metropolitan region. Its popular amenities included the Totem Pole Ballroom, a zoo, picnic areas and boathouses with hundreds of canoes.

The Charles River Canoe and Kayak Service, housed in the historic MDC police station, is located where the Lakes meet Commonwealth Avenue at the head of the Lakes District. This location will be a visitor center similar to those proposed at Dealtry Pool and at the Charles River Museum of Industry. Since the Charles River Watershed Association's headquarters is located next door, interpretive themes at this center could focus on ecological topics such as improving water quality, watershed planning activities, and solving pollution problems. In addition, regional recreation such as canoeing traditions and nineteenth century parks and landscapes could be interpreted using the many wonderful historic photographs available for this area. With public parking available a short walk across the river and the number of boat rentals continually rising, this center offers the perfect introduction to the Lakes region of the Upper Charles Reservation.



Eroded bank in Auburndale Park needs repair

Walking Opportunities

Within its 130 acres, the Upper Charles River Reservation contains a variety of walks that enable visitors to experience as much of the Reservation as they have time for on any day. The number of bridges crossing the River conveniently creates many possibilities for "loop walks" returning to one's starting point. Following are the major walking routes and their mileages through the Reservation.

1. Loop Walk: Watertown Square to Bridge Street (Watertown):

The total mileage of this loop is 2.3 miles. Parking is available at the MDC Dealtry Pool off Pleasant Street in Watertown on the north side of the river.

Starting at the Dealtry Pool, this loop is paved and wheelchair accessible, crossing the River on Bridge Street and Galen Street. Amenities include boardwalks, viewing decks, river access areas, benches, and grassy areas for picnicking. Smaller loops may also be made in this area by crossing the River on the footbridge adjacent to Dealtry Pool. The Reservation in this loop contains approximately 21 acres of parkland.

2. Loop Connector: Bridge Street to the Calvary Street Footbridge (Newton, Watertown, and Waltham):

The total mileage of this walk is 1.3 miles. Parking is available at Cannalonga Park, or at the opposite end of this walk, at the Ames Shopping Center.

This connector walk links loops (1) and (3). Commencing at Bridge Street on the south side of the river, the visitor travels through a forested floodplain for about .4 miles, almost to the outlet of Cheesecake Brook. Near the brook, a proposed footbridge over the Charles will enable passage to

the north side of the river, where the path will enter another forested floodplain before running to Farwell Street (another .4 miles). After crossing the Farwell Street Bridge to the south side of the river, one path follows the upland side of another forested floodplain, while a secondary path winds through the lower floodplain. The dual paths meet at the Bleachery Dam where the paved path continues west to the Calvary Street Footbridge. This last portion of path from Farwell Street is a half mile in length.

Including Cannalonga Park, this stretch of the Reservation contains approximately 28 acres.

3. Loop Walk: Calvary Street Footbridge to Elm Street (Waltham):

The total mileage of this loop is 1.3 miles. Parking is available at Ames Shopping Center or at the west end of the loop off of Pine Street, across the river from Landry Park.

Start at either the west or east end on either the north (unpaved path) or south (paved path) side of the river and continue on the whole loop, crossing Newton Street in the middle. For a shorter loop, one may also cross the river at Newton Street and return to the start. In order to continue on the north side of the river at Newton Street, visitors will need to walk up to River Street and around the MDC Connors Pool on the public sidewalk.

The Reservation along this loop contains approximately 12 acres.

4. Loop Connector: Landry Park through Riverwalk Park (Waltham):

The total mileage of this walk is 1.1 miles. Parking is available across the river from Landry Park, off of Pine Street.

This fully paved, and wheelchair accessible walk links loops (3) and (5). The visitor will first cross the footbridge from the parking lot to the north side of

the river and pass through Landry park, adjacent to the Moody Street Dam and the Charles River Museum of Industry. After crossing Moody Street, the paved path continues west through Riverwalk Park to Prospect Street and the easternmost point of the Lakes District. This walk can become a loop by crossing over the Prospect Street Bridge to the south side of the River and returning to Landry Park via the Crescent Street sidewalk, and Cronin's Landing riverwalk.

The Reservation in this vicinity consists of approximately 8 acres.

5. Loop Walk: Prospect Street to Commonwealth Avenue (Waltham, Newton, and Weston):

The total mileage of this loop is approximately 8 miles as it travels completely around the Lakes District. The northwest shore contains approximately 4.5 miles of main path, and the southeast shore is approximately 3.5 miles. "Spur" paths and trails can increase this total to 10 miles. Parking is available at several locations: at the MDC Duck Viewing Area in Weston, along Norumbega Road adjacent to the Norumbega Tower in Weston, along Charles River Road in Waltham, at the Woerd Avenue Boat Launch and Forest Grove Park in Waltham, and at Auburndale Park in Newton.

The route through this loop winds through MDC and other public open space, including the extensive Mt. Feake Cemetery, and occasionally uses public sidewalks to complete the circuit. Paths vary widely in material, and a number of secondary and informal paths exist that would add to the total mileage of path in the Lakes District. This loop is one of the most scenic in the Boston Metropolitan area.

Including the islands in the Lakes District, MDC owned property in this extensive loop comprises approximately 60 acres of parkland.



IMPLEMENTATION

IMPLEMENTATION Phasing the Master Plan

The intent of the phasing sequence for implementation of the Master Plan is to extend public access and associated improvements along the River gradually westward from the current end of the MDC's pathway system at Watertown Square. Thus, the first phase starts at the foot of the Galen Street Bridge in Watertown, and the final phase will involve improvements within the Lakes District in order to complete this 5.75 mile stretch of the River. The phases of construction currently envisioned are as follows:

Phase 1 (Sub-phases 1A and 1B)

This phase of work includes two separate construction contracts called Phase 1A and 1B. Phase 1A is in Watertown and extends along the north side of the River from the Galen Street Reservation entrance westerly to Bridge Street.

Phase 1B has two segments, both on the south bank of the River. The first, in the city of Newton adjacent to California Street, extends from the existing MDC parkland at the Newton/Watertown boundary westerly along the River until it meets the California Street sidewalk just east of Bridge Street. The second segment, starts at Farwell Street in Waltham, and extends westerly to Elm Street adjacent to Cacciatore Field. Also included in Phase 1B is a small park on the north bank at the Bleachery Dam off River Street, and a park / overlook off Pleasant Street in Watertown.

The total of Phase 1 accomplishes several important MDC objectives at once:

1. The selected stretches of river will provide significant improvements for each of three cities or towns: Watertown, Newton, and Waltham.
2. Most encroachments onto MDC lands are located within the Phase 1 areas. Thus, upon completion of this phase, ownership and boundary issues can be positively resolved early in the overall project.
3. By completing both sides of the River between Galen and Bridge Streets, a two mile, wheelchair accessible trail loop can be created.

Phase 2

This phase includes improvements on both sides of the River between Bridge Street and Farwell Street, in Newton, Watertown, and Waltham. On the south side, pathway and other improvements will extend from Bridge Street to Cheesecake Brook. At the Brook, a new bridge over the Charles will connect the south and the north banks, where the pathway will continue westerly to Farwell Street. The last piece of this work, the connection to Farwell Street, will be within the city of Waltham.

Phase 2 includes another important pathway link on the north bank, extending from the Calvary Street Footbridge westerly to Elm Street in Waltham. This stretch provides all non-paved pathways with the exception of the crossing of Newton Street and a paved sidewalk link around the MDC property at the Connors Pool.

In addition to the above pathways and the footbridge, the following individual and separate improvements are included in Phase 2:

1. Renovation of the Woerd Avenue boat launch facility, including the parking lot and launching ramp, and providing a pathway through the scenic forested area immediately to the north of the parking area.
2. Repainting of the Watertown Dam footbridge.
3. Construction of a new pathway on the south side of the River, approximately 500 feet in length, connecting the Elm Street Bridge in Waltham with the Embassy parking lot (opposite the Charles River Museum of Industry).
4. Construction of a new pathway in Watertown on the south side of the River linking Galen Street to the footbridge at the Watertown Dam. This new path will run through existing MDC parkland.
5. Installation of five new greenway entrances:
 - At the Moody Street entrance to Riverwalk Park (*Waltham*).
 - At the Prospect Street entrance to Riverwalk Park (*Waltham*).
 - At the Northeast end of the Elm Street Bridge (*Waltham*).
 - At the Reservation entry west of the MDC's Connors Pool (*Waltham*).
 - At the Lyons Field adjacent to Commonwealth Avenue by the Newton Marriott Hotel (*Newton*).

This phase will connect all missing links from Phase 1A and 1B. With the completion of Phase 2, new public access will then extend on one or both sides of the Charles from Watertown Square to the Lakes District.

Phase 3

In Waltham, Weston, and Newton, this phase includes the entire Lakes District. The first half of the phase stretches along the westerly edge of the Lakes District, from Mt. Feake Cemetery on the north to the MDC duck viewing area on the south. While this seems overly extensive, most work will be concentrated in and around Roberts Bay and Kingsbury Cove. Improvements here primarily involve renovation of existing paths, new pathway construction, shoreline restoration, and a new footbridge over Stoney Brook. Outside this focal area, individual sites are identified for improvement. These include replanting of the duck viewing area, upgrading the Waltham Pump Station site as a picnic ground and canoe landing, and developing a canoe launch adjacent to the Prospect Street Bridge.

The second half of this final phase extends along the easterly side of the Lakes District from Cram's Cove on the north to the Charles River Canoe and Kayak Center on the south. Since this area already includes significant parks and open spaces with many existing trails, the work here is primarily restorative and additive in nature. The focus of improvements is on upgrading of existing facilities and maximizing available recreational and natural opportunities. As with the westerly edge of the Lakes, path renovation, some new pathway work, and water's edge restoration would be accomplished. Interpretation of this area's illustrative recreational history and its current ecological assets will also be an important part of this phase. Finally, with the myriad of existing paths and some discontinuous public ownership of the shore, visitor orientation and direction will be a key goal in this section of the Lakes.

Project Costs

Improvements to the Upper Charles River Reservation will be constructed over time as funding is available and in accordance with the phasing sequence described above. The following are preliminary estimates of the construction costs, listed in 1998 dollars, for each of the proposed phases.

Phase 1A: \$1,300,000 *
(Watertown Square to Bridge Street, north side)

Phase 1B: \$1,800,000 *
(Watertown Square to Bridge Street, south side and Farwell to Elm, southside)

Phase 2: \$2,180,000 **
(Bridge Street to Farwell, both sides; Calvary Street Footbridge to Elm, north side; Elm Street to Landry Park, south side; Woerd Avenue boat launch; New entrances; painting foot bridge at Watertown Dam)

Phase 3: \$1,610,000 **
(Lakes District improvements)

Total Estimated Cost: \$6,890,000

* Amount based upon bid prices
** Amount includes estimate plus 15% contingency

A variety of recommendations presented in the Master Plan are not included in the above costs because the item or area concerned is not owned by the MDC or is not able to be included in a phased contract administered by the MDC. These items will have to be achieved separately by the owner, or over time by the MDC as budgets allow:

- 1. Cutting/harvesting aquatic vegetation in the Lakes.
- 2. Bridge modifications/repairs.
- 3. Upgrading of public sidewalks that provide pedestrian connections between pathways.
- 4. Improving flow in and out of Cram's Cove or Purgatory Cove.
- 5. Interior improvements to the eventual visitor centers: Charles River Canoe & Kayak Service, Charles River Museum of Industry, and Dealtry Pool.
- 6. Site improvements around the Waltham Watch Factory building.
- 7. Clean up of the River embankment along Crescent Street in Waltham (between Prospect Street and Cronin's Landing).
- 8. Wall graphics on the exterior face of the MDC Testing Lab building at Newton Street in Waltham.
- 9. Dam repairs.
- 10. Land acquisition or permitting costs.
- 11. Remediation for possible hazardous materials.

Permitting Needs

Environmental permits and approvals are required whenever proposed work may affect certain environmentally sensitive resources including waterways, wetland resource areas, habitats or rare and endangered species, and historic and archeological sites. As described below, a variety of environmental permits are needed from federal, state and local agencies for implementation of the Upper Charles River Reservation Master Plan.

Massachusetts Environmental Policy Act (MEPA) Certificate:

On September 9, 1996, the Secretary of Environmental Affairs issued a certificate approving the Environmental Notification Form (ENF). An ENF was filed with the MEPA unit of EOEa because the project is being undertaken by a state agency and has a project cost of more than \$1 million.

The following is a list of other permits that will be required for the projects conceptually described in the Master Plan. As noted below, several of these permits have been applied for and received already enabling the first phases of construction to proceed.

Water Quality Certificate (from DEP Division of Wetlands and Waterways):

Section 401 of the Federal Clean Water Act requires that states issue a Certification that any proposed filling of waterways or wetlands will comply with the state's Surface Water Quality Standards. The need for a Water Quality Certification is triggered when a federal permit is needed for filling wetlands or waterways. A Certificate from MEPA is required before this Certification can be issued.

An application was submitted on February 13, 1996 for Phase 1A and 1B work in the Newton, Waltham and Watertown portions of the Upper Charles River Reservation. Water Quality Certification was granted on March 14, 1996.

Chapter 91 Waterways License (from DEP Division of Waterways):

The Waterways Licensing Program was formally established by the passage of M.G.L. Chapter 91. The Commonwealth's jurisdiction in accordance with Chapter 91 extends to the mean high water mark of tidal waterbodies and the ordinary high water mark of non-tidal waterbodies and great ponds. Public trust rights also include filled tidelands, and therefore, the jurisdiction of the Chapter 91 Waterways

Licensing Program can include previously filled areas to the historic high water mark. On the Charles River, jurisdiction is limited to upstream of the Watertown Dam.

This permit is required for any work conducted at or below the mean high water mark such as rip-rap bank stabilization, river access areas, viewing decks, and boat ramps. A Chapter 91 license application for a water dependent use is being filed for all such structures in phase 1A and 1B work in Newton, Waltham, and Watertown.

Historical and Archeological Resources:

Additional state approvals may be required from the Massachusetts Historical Commission for any work in areas of historic or archeological significance, and the Executive Office of Transportation and Construction for review of any proposed construction on former railroad property.

Order of Conditions (Watertown, Newton, Waltham and Weston Conservation Commissions):

The Massachusetts Wetlands Protection Act (M.G.L. Chapter 131 Section 40) and Regulations (310 CMR 10.00) were established to protect wetland resource areas because of the valuable functions wetlands provide such as: protection of public and private water supply; protection of groundwater supply; flood control; storm damage prevention; prevention of pollution; protection of land containing shellfish; protection of fisheries; and protection of wildlife habitat. Authorization is required from the municipal Conservation Commission for any work in and adjacent to protected wetland resource areas. This authorization can be provided in two different mechanisms. An Order of Conditions (wetland permit) is required for any work within a protected wetland resource

area, or when the Conservation Commission determines that an Order of Conditions will be required for work in the 100-foot Buffer Zone area. The Conservation Commission holds a public hearing to review the proposed activities subject to jurisdiction of the Wetlands Protection Act and receives input from the public before issuing a permit decision.

Prior to passage of the Rivers Protection Act, Notices of Intent were filed in Waltham, Newton and Watertown in January and February of 1996 for Phase 1A and Phase 1B of the proposed work. Orders of Conditions were granted in March of 1996. Additional Orders of Conditions will be required for future phases of work within the Master Plan area. They will require compliance with work in the "Riverfront Area," a 200 foot zone extending landward from the top of the river bank. There are some provisions under 310 CMR 10.53 (3) and (6) which allow water dependent projects and pathways within the Riverfront Area.

U.S. Army Corps of Engineers Permit (Section 10 and/ or Section 404):

Work in wetlands and waterways is regulated by the U.S. Army Corps of Engineers (ACOE) under the authority of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. In Massachusetts, the ACOE has developed the Massachusetts Programmatic General Permit (PGP) to expedite their evaluation of permit applications and streamline the permitting process. The ACOE, along with other federal resource agencies (U.S. Fish and Wildlife Service, National Marine Fisheries Service, and the Environmental Protection Agency), reviews applications and determines permit eligibility.

A permit application was submitted to the ACOE in February of 1996, and in March of

1996 it was determined that the proposed activity in Phase 1A and Phase 1B of the Master Plan area was eligible for a PGP. Additional filings will be necessary for subsequent phases of work.

NPDES Permit (for construction activities):

The National Pollutant Discharge Elimination System Permit (NPDES Storm Water Permit) program under Section 402 of the Clean Water Act aims to identify, regulate and reduce point source discharges of pollution to waterways, and also aims to regulate certain storm water discharges. A General Permit for construction activities was developed to regulate stormwater runoff from construction sites that will disturb five acres or more of land and discharge runoff to wetlands or waterways via point source. To comply with this General Permit, a Stormwater Pollution Prevention Plan is required, and a notice must be submitted to the EPA at least forty eight hours prior to the commencement of construction. A Notice of Termination must also be submitted when construction is completed. To be in compliance with the General Permit, the Pollution Prevention Plan (PPP) must be retained on site, and the Best Management Practices outlined in the PPP must be implemented.

Maintenance and Management Guidelines

Park-like Landscapes and Reservation Entrances

(These areas include the Duck Viewing Area, Dealtry Pool, Charles River Canoe and Kayak Service, Cannalonga Park, Landry Park, Woerd Avenue Boat Launch, Norumbega Tower, Forest Grove Park; lawn at Charles River Road, Ames Park, Riverwalk Park. Also included are several "lawn areas" along the pathway in Phases 1A and 1B, such as that adjacent to Boston Edison in Waltham near the Bleachery Dam.)

1. TURF MANAGEMENT

- A. *Watering* - should occur in early morning whenever rainfall is less than one inch every 5 to 7 days. The lowest rainfall frequency typically occurs in July and August.
- B. *Mowing* - should occur when grass is of sufficient length to produce 2 inch clippings. Typically once a week in the Spring and Fall, and every other week in July and August.
- C. *Fertilization* - use only low nitrogen and/or slow release fertilizer. It should be used in moderation and only where it is necessary. Once a year is recommended, in early September or late Spring. Water thoroughly after application to prevent burning.
- D. *Pest and disease control* - may be required to eliminate specific problems. Consult with a county Extension Agent for identification and recommendations.

E. *Dethatching* - is required when the layer of undecomposed cuttings becomes greater than 3/4 of an inch thick.

F. *Aeration* - will be required of compacted areas in the spring, after dethatching.

G. *Soil tests* - should be done once a year to establish turf needs for lime and fertilizer.

2. TREES, SHRUBS AND GROUND COVER MAINTENANCE

A. *Watering* - plants should be inspected for watering needs at least twice each week during the growing season and watered as necessary to promote plant growth and vitality (once a week during periods when rainfall is less than one inch every 5 to 7 days).

B. *Fertilizing* - should be applied annually in early spring or late fall, and as determined by soil tests regarding nutrient levels for specific plants.

C. *Mulch* - should be inspected annually in the spring and maintained at a depth of two inches for tree pits and three inches for shrub and groundcover beds. Mulching conserves moisture, retards the growth of weeds and stabilizes ground temperatures. Weeding of beds should be done monthly from spring to fall.

D. *Pest and disease control* - may be required for specific problems. Consult with a county Extension Agent for identification and recommendations.

E. *Pruning* - should occur annually to remove dead/dying/diseased or rubbing branches.

F. *Plant replacement* - should be with recommended plant species as soon as planting conditions permit.

3. CLEAN UP ALL DEBRIS, LITTER AND LEAVES IN EARLY SPRING AND LATE FALL.

4. COLLECT TRASH FROM ALL TRASH RECEPTACLES AND DISPOSE OF OFF-SITE ONCE A WEEK FROM APRIL THROUGH OCTOBER.

5. INSPECT ALL PAVEMENTS ANNUALLY, AND REPAIR AS REQUIRED.

6. INSPECT SITE FURNISHINGS ANNUALLY IN THE SPRING AND REPAIR/ REPLACE AS NECESSARY - BENCHES, GRANITE PILLARS, WALLS, GUARDRAILS, FENCING, BOUNDARY MARKERS, BOARDWALKS, SIGNS, TRASH RECEPTACLES, INTERPRETIVE FEATURES, ETC.

7. VISUALLY INSPECT STORM DRAINAGE STRUCTURES ANNUALLY BY REMOVING COVERS OR GRATES. CLEAN AS NECESSARY TO INSURE UNINTERRUPTED FLOW.

Riparian Woodlands

(These areas include more natural areas along the corridor, such as forested floodplains)

1. PATHWAY MAINTENANCE

A. Paved paths should be swept and inspected for damage or settlement each spring and repaired as necessary.

B. Unpaved paths should be inspected each spring also; holes or washouts should be filled, weeds removed, and any other repairs should be made as necessary.

2. PERIODIC MOWING

- A. Mow the sides of the path up to the shrub layer, biannually.
- 3. CLEAN UP ALL DEBRIS AND LITTER TWICE ANNUALLY IN EARLY SPRING AND LATE FALL.
- 4. VEGETATION/ WILDLIFE HABITAT MANAGEMENT

Habitat management activities should be kept to a minimum and carefully done within the valuable forested floodplains and other wetland communities present along the Charles River corridor so as not to disturb already functioning and healthy habitat.

A. *Maintain buffer/ corridor* - Maintain a continuous and well-vegetated buffer along the river bank, and throughout the corridor, connecting open space areas.

Through appropriate policing, limit human disturbance such as dumping, trampling and the cutting of vegetation.

B. *Maintain habitat structure* - Maintain multilayered vegetation (i.e., trees, saplings, shrubs, forbs and grasses) containing a variety of native plant species. Periodic thinning of overstory vegetation within upland forested areas will tend to increase vertical diversity. These thinnings should favor retaining conifers and mast producing deciduous trees.

Portions of the floodplain adjacent to the Charles River contain dense shrub thickets and/ or openings with tall herbaceous growth. These habitats contribute to the diversity of wildlife within the River corridor and should be maintained. Thinning of tree saplings should be periodically undertaken (at least once every 5 years) in these areas to maintain the dense shrub thickets while herbaceous vegetation can be maintained by annual mowing. Thinning and/ or mowing should ideally be undertaken in early spring or after August 1st (when most young

have sufficient mobility to escape maintenance activities).

Leave snags (an average of 4 per acre to maintain self-sustaining populations of cavity dependent wildlife species) and some fallen trunks and limbs on the ground to decompose. At least 2 of the 4 cavity trees left should be greater than 14 inches in diameter.

C. *Control opportunistic/ exotic species* - Because the use of herbicides to control problem species can be detrimental to native flora and fauna, it is proposed that only non-chemical methods such as uprooting, cutting, mowing and girdling of shrubs be used as a means to limit exotic and opportunistic species in select areas along the river corridor.

Japanese Knotweed, European Buckthorn, or False Indigo Bush are the most abundant opportunistic or exotic species found along or near the pathway system. The proposed methods for controlling these species are as follows:

Japanese Knotweed - Weekly mowing of the entire patch during the growing season. The areas should then be grubbed and any remaining plant parts removed. Revegetation should include seeding with a temporary non-invasive herbaceous cover such as Millet and planting with native shrub and tree species.

European Buckthorn and False Indigo - Spring sprouts and young seedlings and shrubs should be hand-pulled in early spring. Larger stems should be cut repeatedly 3 to 6 times during the growing season for several years to achieve plant mortality, and the areas interplanted with native shrubs and tree species.

It should be noted that cutting must be repeated and continued for sometime or the effect may be an increase in the density of shoots and not a decrease. Subsequent approval of some stump application of an herbicide may be required for effective control.

Only specific herbicides, approved for use in wet-

lands should be applied, and only by licensed herbicide applicators or operators. The criticism of the use of chemical controls on natural habitats depends on the percentage of habitat treated and the care with which the treatment is delivered. The delivery system should be as gentle and target specific as possible.

D. *Selective pruning (minimal)* - As a safety precaution, overhead vegetation should be trimmed regularly to provide adequate headroom for people on pathways. A minimum of 8.5 feet of clearance should accommodate both pedestrian and bicycle traffic. Dead trees or limbs that might fall on the pathway or boardwalks, or at the pathway edge, should be cleared away as soon as possible.

5. BOARDWALKS AND VIEWING DECKS

A. Annually in early spring, check for loose, missing or bowed boards, splintering boards (particularly on handrails), loose or protruding nails/screws, graffiti, and remove, repair or replace as necessary.

B. Stain annually with "Seasonite" (or equal) to prolong life of wood structures.

6. RIVER BANKS (ANNUAL TASKS)

A. Clean up all debris and litter in early spring.

B. Maintain "river access areas" by adding river cobbles when necessary and removing graffiti from boulders.

C. Control opportunistic/ exotic species by means described above.

D. Remove shopping carts and other large debris from the river as necessary.

E. Preserve "scenic vistas" established in Order of Conditions by selective thinning and pruning.



APPENDICES

APPENDICES

Historic Context

"Thus has nature placed and preserved at the very gates of Boston riches of scenery Chicago or Denver or many another American city would give millions to create, if it were possible. Stupid indeed will be the people of greater Boston if they fail to perceive and attend to their interests in this matter before the opportunity is lost."

Charles Eliot

In 1891, a remarkable young landscape architect named Charles Eliot helped galvanize many men and women concerned that the growth of Boston would destroy the beauty of its native landscape. The challenge was too great for a single community, so in 1893, a new regional agency was created: the Metropolitan Park Commission (MPC), the forerunner of the present Metropolitan District Commission (MDC). Following the urging of Charles Eliot, Sylvester Baxter, and others, in its first five years, the MPC acquired 9,000 acres of park land, over half of the present 17,000 acre park system.

The Upper Charles River Reservation was a primary focus of the original park land acquisitions. Between 1897 and 1898, approximately 300 acres of open space were acquired along the Upper Charles between the Watertown Dam and Hemlock Gorge in Newton. These key land acquisitions were intended to buffer the river from pollution by industrial development, to add value to adjacent property, to provide public recreation and to preserve scenery. Hemlock Gorge, Riverside, and Norumbega attracted thousands of people in the early 1900's.

The Upper Charles River Reservation, in particular Riverside Recreation Area (with its Olympic pool and over 4,000 moored canoes) and Norumbega Park (with its zoo, rides, and the famous Totem Pole Dance Hall), became one of

the most popular recreation sites in metropolitan Boston. There were also popular bathing beaches, with facilities in West Roxbury, Watertown, and Waltham. River swimming was made more desirable by the construction of two new trunk sewers at the turn of the century, which significantly improved water quality.

The sewers built at the turn of the century could not keep up with the intense growth in the region, and the river's water quality deteriorated once again. Sewage and industrial wastes, already a problem in the late 1890's, intensified as development increased rapidly throughout the metropolitan area. The public lost interest in the river and its resources. Riverside and Norumbega Parks fell into disrepair and were eventually closed in the early 1960's. River abutters began using public park lands purchased in the 1890's for private purposes, and significant portions of this land were sold. Neglect and abuse became common place treatment of our public lands.

Fortunately, in the 1970's, the new environmental consciousness stimulated a renewed concern for the Charles River and its banks. Numerous public initiatives by the MDC, Department of Environmental Protection, the Federal Court, and the Charles River Watershed Association significantly improved the river's water quality. It is reported that from the late sixties to 1985, at least \$100 million was spent in the Charles River Watershed for pollution abatement. As expected, cleaner water has strengthened the river's value as an ecological and recreational resource. Along with others, the MDC has provided impetus for a renewed level of public appreciation, interest and concern for the Upper Charles River Reservation. Since 1980, joint efforts between the cities/towns, businesses, and the MDC have resulted in five new river bank parks, land gifts, and extensive clean up of the river's banks.

In 1992, the MDC conducted a formal survey of its property along portions of the Upper

Charles. The survey confirmed that the MDC owns enough land along the river banks to develop a wonderful river corridor greenway through the cities and towns of Watertown, Newton, Waltham and Weston. Development of a comprehensive reclamation plan was the next important step in recapturing the century-old vision of Charles Eliot to establish a system of public open spaces along the banks of all the region's rivers.

The cycles outlined above, of historic protection, recreational development, heavy use, resource decline and present day rediscovery of the Upper Charles River Reservation, reflect America's shifting values and attitudes towards public open space throughout the last century. Spurred by federal legislation, the 1970's environmental movement was the key catalyst to the present day rediscovery and advocacy for public park lands such as the Charles River and its banks. The MDC is committed to working with River users and neighbors to assure long term care and stewardship for this extraordinary Reservation.

APPENDICES

Developing the Plan

The planning process for the Upper Charles River Reservation Master Plan demanded public involvement from its inception. As early as 1993, following preparation of its property boundary surveys, the MDC invited all abutters and local officials to a public meeting to present its general plan to reclaim the river corridor as a greenway. Other presentations to local groups, including radio, television, and extensive newspaper coverage occurred during 1993. In 1994, the MDC retained Carol R. Johnson Associates, Inc. and the formal master planning process was initiated in August of the same year. To obtain valuable community advice and opinion, the MDC organized and convened a Citizens Advisory Committee (CAC), consisting of forty members. The Committee was comprised of interested citizens, elected local and state officials, abutters, and Conservation Commission members from the four communities involved, as well as representatives from advocacy groups such as the Charles River Watershed Association and the Newton Conservators. A list of CAC participants is included in the back of this report.

The master planning process consisted of four phases of work as outlined below:

1. Inventory Phase

This initial phase started with the planning team becoming familiar with the project extent through aerial and ground photography, as well as walking and canoeing the entire River corridor. The major tasks of the phase included collecting and mapping data on existing resources, and developing a framework of project goals which would serve as a guide throughout the Master Plan process. For ease of communication, the Inventory examined existing features in five categories: River's Edge Conditions, Land Use and Ownership, Visual Char-

acter, Circulation and Access, and Vegetation and River Corridor Ecology. Colored maps and descriptive text were prepared for each of the categories to document the findings of this phase.

2. Analysis and Alternatives Phase

The inventory data was used to develop a comprehensive list of features or conditions that provide opportunities or constraints to achievement of the project goals. Annotated maps were created to illustrate and locate both opportunities and constraints. Based upon these, the team developed three alternative development concepts for improvements to the River corridor. The "Recreational River" concept focused on improving visitor access, upgrading existing parks, and focused on promoting the Reservation as a recreational resource for community and regional use. The "Educational River" concept emphasized interpretive programs and activities related to the River as an educational resource for school groups, institutions, and adjacent communities. Finally, the "Natural River" concept concentrated on the goal of preserving and enhancing natural resources and wildlife habitat.

After public presentations and discussions with the CAC regarding the Analysis and Alternatives, the group concluded that the "Natural River" concept, modified by elements of the "Recreational" and "Educational" concepts, was the most desirable direction for the Master Plan to pursue. This "least impact" approach was to be developed, along with appropriately scaled passive recreation and non-obtrusive interpretive features.

3. Preferred Alternative Phase

During this phase, the planning team developed plans and sketches illustrating proposed improvements to the Reservation that would support and celebrate the "Natural River" theme. "Before

and After" sketches were most effective in portraying the character of the changes envisioned for various places along the River. To conclude the phase, a slide presentation was prepared in the form of a walking tour through the new Reservation. As part of this presentation to the CAC, the details of proposals were discussed, including pathway materials and widths, boardwalks and viewing decks, wetland alterations, parking opportunities, primary and secondary access points, the design of entrance pillars, interpretive boulders, maintenance needs, security issues for abutters, and connections to existing parks and open spaces.

4. Final Master Plan Phase

This phase was devoted to further refining all Master Plan proposals, final review with the CAC, estimating construction costs to realize the Plan, and preparing a formal report detailing the entire Reservation Master Plan. Along with the Final Report, the planning team prepared a pocket-sized, fold-out brochure to be used as a trail guide for visitors to the new Reservation.

Over a period of fourteen months, a series of six public meetings were conducted during the four phases to solicit ideas and comments from the CAC members and the public at large. Critical input was obtained, allowing plans to be developed in concert with those most affected by the project proposals throughout the river corridor.

Encroachment Resolution

For several decades, commercial, industrial and residential owners abutting the River have allowed personal and business activities to extend onto MDC parkland. These activities, or encroachments, include planting vegetable gardens, installing fencing and pavements, filling, parking vehicles, storage of construction materials, and even construction of buildings. At the outset of planning for the new Upper Charles River Reservation, it was clear that misuse of MDC land could not continue and that encroachments would have to be removed.

Since 1991, the MDC, under the direction of Senior Planner Dan Driscoll, has worked closely with abutters and the Massachusetts Attorney General's Office to eliminate encroachments and reclaim the affected public lands for use within the Upper Charles River greenway. The successful encroachment resolution process developed for this project may become a model for other land management agencies throughout the United States with similar reclamation goals.

The major steps in the MDC resolution process are as follows:

1. **Determine property lines** – includes property line survey and setting permanent markers to identify property limits.
2. **Identify and document encroachments** – includes photographs, slides, and narrated video to establish the extent of encroachments.
3. **Research ownership** – includes accurate listing of legal owners and current occupants of abutting properties, as well as leases or special permits affecting use of the property.

4. **Communicate long-term greenway strategy** – includes public meeting(s) to convey project goals, community benefits, and intended improvements.

5. **Develop fair compensation system** – The MDC chose not to charge for back rent or punitive damages for the use of its land in order to avoid ill will and encourage future partnerships with abutters. However, the MDC did require payment for “semipermanent” encroachments: Eight dollars per square yard for gravel surfacing and twelve dollars per square yard for pavements. These were estimated to be the costs for removing these materials and replacing them with loam and grass seed.

6. **Establish an Encroachment Reclamation Trust Fund** – using encroachment payments, this Trust is used only to fund future improvements and maintenance of the Reservation.

7. **Notify property owners** – including written abutter notifications. Two legal forms are used, depending upon the nature of encroachment:

- A. “Acknowledgment of State Ownership/Agreement to Quit” – This form is sent to all encroachers. By signing this form, the abutter formally recognizes state ownership of the property.
- B. “Memorandum of Agreement” (MOA) – This document is sent to abutters with “semipermanent” encroachments. By signing this form, the abutter recognizes the details of the resolution process and agrees to pay appropriate compensation. The Commissioner of the MDC then receives payment, signs the MOA, returns it to the abutter, and thus completes the resolution process.

8. **Continue abutter communication and long-term management** – including keeping abutters informed about agency plans and how Trust funds are being spent.

The above program stresses early public outreach, open and candid communication, accessibility, proper documentation, and clarity of ultimate goals. The success of the program has been founded upon the MDC's active promotion of community partnerships and cooperation among stake holders. MDC planners have been consistently positive, reasonable, respectful and fair in their discussions and negotiations with abutters. Finally, as payments to the Trust are used solely for restoration and maintenance of the Reservation, abutters can feel they are contributing to their community, and can actually see the public benefits generated from this contribution.

Source: The key points of the above summary of the Encroachment Resolution process are taken from a report entitled Realizing the Vision: Reclaiming Public Open Space in The Upper Charles River Reservation, subtitled “A guide for encroachment resolution and land reclamation”, prepared for the Metropolitan District Commission Planning Office by Jennifer R. Yelin, Fall 1997.

Please refer to this report for a more comprehensive discussion of the resolution process and the public participation process that was a key focus of the Upper Charles River Reservation reclamation planning.

Citizens Advisory Committee

The Metropolitan District Commission wishes to thank the following persons for their participation, input, and guidance throughout the Master Plan process:

John S. Allen
Richard Bail
Kenneth E. Bassett
Greg Bialecki
Kate Bowditch
Francis W. and Theresa Boudrot
Mark Boyle
John Bradley
James Broderick
Susan Brown
Dana Burghdoff
Susan Burstein
Eunice K. Burstein
Kathy Button
Gloria Champion
Bill Churchill
Bob Collini
Sally Collura
Jack Cox
George A. Darcy III
Gregory Drake
Gerald Feeley
Roger Feinstein
Debbie Gehrke
Ted Haman

Helen Heyn
Mrs. Stephen T. Hibbard
Janet Jameson
John Larosse
Karen LeBlanc
Brooke Lipsitt
Robert Logan
Frank Manganaro
Rebecca McCullough
Mary Louise McDermott
Karen Nelson
Peter Nicholas
Karen O'Donnell
Deborah Peterson
Margaret Rose
Chris Russell
Walter Salvi
Marty Sender
Larry Smith
Kent Stasiowski
Bill Stevenson
Ingborg Uhler
Ron Vokey
Sam Webb
Eileen Zubrowski
John E. Zuffante

Acknowledgement

The Master Plan consultant team wishes to thank Dan Driscoll of the MDC for his assistance throughout the master planning process. Without his vision, knowledge and sustained commitment, this project and the Master Plan report would not have been possible.